

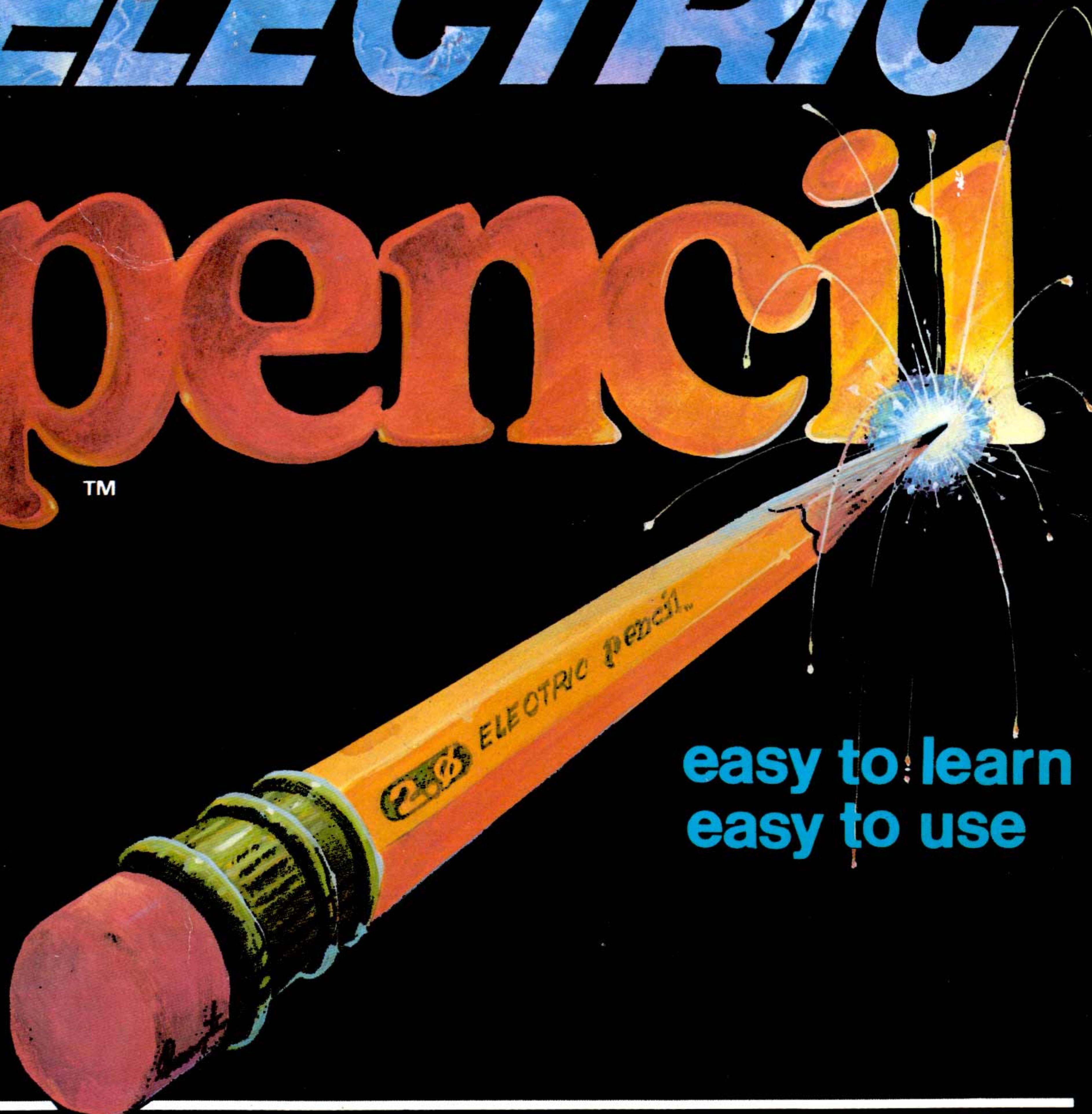
JG

michael shrayer's

**ELECTRIC**

**pencil**

TM



**easy to learn  
easy to use**

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**word processing system**

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**NEW DICT-A-MATIC**  
KEYBOARD CASSETTE  
DICTATION CONTROL!



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There are many DOS (Disk Operating System) software packages for the MODEL I and MODEL III TRS-80 microcomputers. The number of combinations of DOS' and machines and the various incompatibilities between the systems and hardware make it virtually impossible to support every combination possible. THE ELECTRIC PENCIL was designed to run under the following hardware/software systems:

TRS-80 MODEL I and LNW80  
TRSDOS 2.3  
NEWDOS 2.1  
NEWDOS/80 1.0  
NEWDOS/80 2.0

TRS-80 MODEL III  
TRSDOS 1.3  
NEWDOS/80 2.0

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# THE ELECTRIC PENCIL 2.0<sup>T.M.</sup>

By Michael Shrayer

Additional software modifications by  
Richard Schubert

## OPERATOR'S MANUAL

By Michael Shrayer and H.C. Pennington

THE ELECTRIC PENCIL 2.0 (software)  
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## ACKNOWLEDGEMENTS

Special thanks to Michael Shrayer for his unswerving confidence, Al Krug because he can spell, Dick Schubert for his programming talent and tireless pursuit of excellence, and to the thousands of ELECTRIC PENCIL users for making this the most popular word processing system in the world.

This entire book was created with THE ELECTRIC PENCIL version 2.0 and a TRS-80 MODEL I microcomputer with 48K RAM, four disk drives and NEC printer. The operating system used was NEWDOS/80 2.0. First pass proofing and spelling corrections were made with pre-release versions of BLUE PENCIL and RED PENCIL dictionary/correction programs developed by Cornucopia Software, Inc.

## TABLE OF CONTENTS

INTRODUCTION .....	1
USING THIS BOOK .....	2
Notation .....	2
HISTORY .....	5
SYSTEM HARDWARE REQUIREMENTS .....	7
LOADING INSTRUCTIONS .....	8
Tape .....	8
Stringy floppy .....	9
Disk - Single drive system .....	10
Disk - Multiple drive system .....	11
GETTING STARTED "RIGHT NOW"! .....	12
GETTING STARTED .....	14
THE ELECTRIC PENCIL OPERATING INSTRUCTIONS .....	16
Recovering from an accidental exit .....	16
Program Operating Modes .....	17
Text Entry Commands & functions .....	17
Cursor Control Commands .....	18
Editing Commands .....	28
Special Character Keys .....	36
Utility Functions .....	39
Special Purpose Functions .....	44
Reserved Functions .....	45
SYSTEM MENU Commands .....	46
Utility Functions .....	48
System Commands .....	49
File Commands .....	54
Tape Files .....	55
Stringy Floppy Files .....	58
Disk Files .....	61
PRINT MENU commands & the Setting of Print Values ....	67
THE ELECTRIC PENCIL Print Drivers .....	69
Printing Multiple Copies .....	70
Printer Compatability .....	70
Recovering From a Hung Printer Condition .....	70
Print Values .....	71
Printer Control Commands .....	77
Printer Port Selection .....	79
ADDITIONAL NOTES .....	80
Titling & Page Numbering .....	80
Underlining .....	81
SPECIAL TECHNIQUES, TRICKS & TIPS .....	83
BASIC Language Text Editing .....	83
VisiCalc Files .....	83
Embedded Line Printer Codes .....	86
Special "Tricks" .....	91
Good Computer Practices .....	92
Backup Procedures .....	93
MESSAGES & ERROR MESSAGES .....	96
APPENDIX I - GLOSSARY .....	100
APPENDIX II - Using Special Print Drivers .....	108
APPENDIX III - Customer Service & Software Support ..	110
APPENDIX IV - Future ELECTRIC PENCIL Products ....	114
APPENDIX V - Other Programs & ELECTRIC PENCIL ....	116
QUICK REFERENCE GUIDE .....	122
TEXT ENTRY COMMANDS Sub-contents .....	17
SYSTEM MENU Sub-contents .....	47
PRINT MENU Sub-contents .....	68

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## INTRODUCTION

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Software packages, like people, usually have "personalities". It is THE ELECTRIC PENCIL's personality that makes it easy to use. Unlike other word processors, it has a simple two-keystroke command structure. In plain english, this means that you only have to press two keys to execute any of the "control commands" such as INSERT, DELETE, PRINT and others.

THE ELECTRIC PENCIL does not require a six hour tape instruction course before you can learn how to use it. You will not have to keep your nose in a manual to make it do the things you want. You do not need special key-decals to remember key functions. It does not require that you use complicated "command syntax" to accomplish the things you want to do. In fact, you will probably be able to start making productive use of THE ELECTRIC PENCIL in under one hour!

THE ELECTRIC PENCIL is a Character Oriented Word Processor. This means that text is typed in as a continuous "string" of characters and is handled as such. (A "string of characters" means a group of letters, symbols and numbers - like the text you are reading now.) This allows you enormous freedom and ease in the movement and handling of text. Since the lines that will be sent to the printer are not specified in advance, any number of characters, words, lines or paragraphs may be inserted or deleted anywhere in the text. The entire text is shifted as you insert and delete characters.

The typing of carriage returns as well as word hyphenation is not required since each line of text is formatted automatically. As text is typed in and the end of a screen line is reached, a partially completed word is shifted to the beginning of the following line. This makes the text easier to read because words are not broken or to use computer jargon, "wrapped around" the screen, from line to line.

Whenever text is inserted or deleted, existing text is shifted down or shifted up. Everything appears on the video display screen as it occurs, and eliminates any guesswork. Text may be reviewed at will, by variable speed scrolling in both directions.

By using the SEARCH or the SEARCH and REPLACE function, any "string" of characters may be located and/or replaced with any other "string" of characters. Specific sets of characters within encoded strings may also be located and used in creating selective mailing lists.

When text is printed, THE ELECTRIC PENCIL automatically inserts carriage returns where they are needed. Many combinations of line length, page length, character spacing, line spacing and page spacing allow for any form to be handled. Right Justification gives right-hand margins that are even. Pages may be numbered as well as titled.

To take full advantage of THE ELECTRIC PENCIL for the TRS-80 MODEL I (The MODEL III comes with the lower case already installed.) the lower case modification kit should be installed. (The MODEL III comes with the lower case already installed.) There are two types of lower case kits and both work equally well. One is offered by RADIO SHACK and the second type is one you may install yourself. The book "The Custom TRS-80 and Other Mysteries", by Dennis B. Kitsz, describes this modification in detail. In addition, a companion kit by TEKNOPAK may be purchased with all of the hardware and instructions necessary to install the kit.

The kit is available through your local TEKNOPAK dealer. If your local computer or electronics dealer does not carry the kit, there is a coupon at the back of this book.

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## USING THIS BOOK

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Instructions are usually dull, boring, and tedious. The language used only faintly resembles English, and is full of computer jargon and explanations that only a programmer could understand are used to explain the simplest things. In this book we have used explanations and examples that anyone can understand. In addition, there is a GLOSSARY at the back of this book which will clarify the jargon: In less than an hour anyone can start using THE ELECTRIC PENCIL productively! In less than a few hours you can be an "expert" at it.

The best way to learn to use THE ELECTRIC PENCIL is to try using the commands as you read about them. By experimenting with different combinations of commands and using THE ELECTRIC PENCIL, you will discover the best way to do the things YOU want to do.

If this is the first time you have used a word processor or the computer is "new" to you or both, then before proceeding, we would recommend that you thoroughly review the TRS-DOS manual.

### NOTATION

One of the most frustrating and confusing things about an instructional book for a computer (This goes for the writer as well as the reader!) is the NOTATION used to indicate what YOU enter (or type) into the computer, what the computer prints out on the video screen, or how we indicate in a book, a SEQUENCE of keys to press or keys that must be PRESSED AT THE SAME TIME. Here are the special notations we have used in this book along with their explanations:

<K> A letter or word enclosed in this type of bracket indicates a key. In this case, the "K" key. <SHIFT> or <SFT> would indicate the "SHIFT" key.

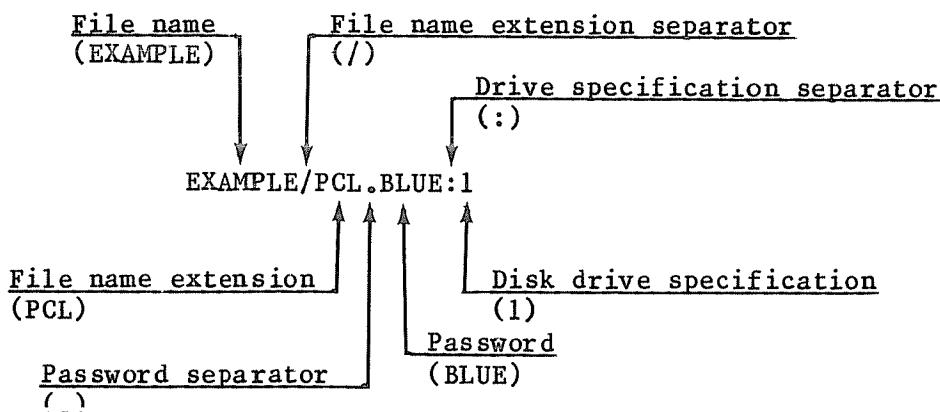
<CTL> or <CONTROL> THE ELECTRIC PENCIL may use either a specially installed "control" key or the "CLEAR" key as a control key. This symbol will indicate that the "CONTROL" key is to be pressed. If you do not have a special control key, then the "CLEAR" key is the control key.

"filespec" Means, FILE SPECIFICATION. The computer stores all information on diskettes as a "file" - picture it as a file folder with a name on it. Programs stored on diskettes are files. Data stored on diskettes are also "files". If you want a particular file folder out of your file cabinet at home or work, you must know the NAME of the file you want. (Excuse me, could you pull the Jones File and put it on my desk?) The computer works in the same way - in order to get a file, we have to have a FILE SPECIFICATION which is the name of the file.

On the TRS-80, you must enter a valid TRSDOS file specification. See the "TRS-DOS Disk Operating System Manual" section 3, page 6.

Everyone (almost everyone, anyway) has a first and last name. File names can have first and last names too. When a file has a "last name" we call it an EXTENSION or FILE NAME EXTENSION. THE ELECTRIC PENCIL uses its own file extension; "/PCL". This is how it recognizes its own files when you display the disk directory. You may also enter your own file extension (i.e., filenames with extension other than "/PCL") and these will be displayed in the directory on disk systems. This is done by using the asterisk option with the DIR command. (Also see DIR and SAVE.)

There is one more thing about file names: So far we have FIRST names, LAST names and now we have passwords. If you worked for the CIA, you would have a special CODE NAME. You would tell your secrets only to those people that could call you by this special "code name" or password. Files can have passwords too. If you try to LOAD a file that has a password and you don't give the password, the computer will give you this message: FILE ACCESS DENIED. Here are the parts of a FILE SPECIFICATION:



In the above example we have a file with the name, "EXAMPLE" whose extension is "PCL", its password is "BLUE" and it is on disk drive number "1".

**<ENTER>** The "enter key" is the large white key on the right side of the keyboard. It even has the word "enter" right on it. It corresponds to the "carriage return" key on an electric typewriter.

The <ENTER> key does not have a character symbol of its own. When we are using a word processor, we need to be able to see some kind of a symbol to indicate that a carriage return was entered. THE ELECTRIC PENCIL uses a "left arrow" symbol to indicate a carriage return. it looks like this: <-

'nnnn' means to use a number in place of 'nnnn'. For instance, suppose you see a notation that looks like this:

'PLnnn <ENTER>', where 'nnn' is a number between 0 and 255

then you would substitute a number between zero and two-hundred fifty-five for 'nnn'. If the number you wanted was "10" then you would type:

PL10 <ENTER>

<CTL>-<T> Brackets with a hyphen between them indicates that both keys are to be pressed AT THE SAME TIME! In this case you would hold the control key down while you pressed the "T" key.

<CTL>-<R>, n, n, <any key> This is ELECTRIC PENCIL's "repeat" function. Any key or command may be repeated. Let's suppose that you want a string of 50 asterisks across the page like this:

\*\*\*\*\*

you would press the keys like this:

1. Hold down the <CONTROL> key and press the <R> key.
2. Release the <CONTROL> and <R> keys.
3. Press the <5> key.
4. Press the <Ø> key.
5. Press the <\*> key.

SPACES AND OTHER SPECIAL CHARACTERS - A difficult concept to grasp is that "spaces" are treated as "characters" or symbols. A "character" is anything that appears on your video screen when you press a key. Here is a list of the different types of characters your computer can make:

Letter characters - "A" through "Z" in upper and lower case.

Number characters - "0" through "9"

Symbol characters - "!", "%", "\*" or any non-letter or number character that may be entered from the keyboard by pressing a single key or combination of keys. Some characters however, cannot be generated from the keyboard at all. The underline character is one of these. It is stored in the computer but there is no underline key. THE ELECTRIC PENCIL generates this character when the <CLEAR> or <CTL> and <Ø> key are pressed at the same time. -

"Unprintable characters" - These characters are generated when you press a key, like the "BREAK" key. There are no symbols for these "characters"; but sometimes, in order to "see" them, we assign a character to REPRESENT the "unprintable" character. The <ENTER> or "CARRIAGE RETURN" key is one of the "unprintable" characters and we have ASSIGNED the left arrow (←) to represent that key. There are other "unprintable" characters that THE ELECTRIC PENCIL does not assign characters to at all, but they are of no particular concern to us.

A "space" or "blank" on the screen (such as the space between two words) is a character -- we just cannot see it. It is treated as any other character, however. We can only "see" a space character when we can see other characters on either side of it. Spaces are ALWAYS considered when entering, formatting, or printing, just like any other character.

Because they cannot be "seen", at least like we "see" any other character, we sometimes forget that they exist. This can, from time to time, cause some problems that we would not consider if we were using an ordinary typewriter. Whenever you have a problem with your text and cannot seem to find a solution for it, look for the "unseen" - usually a group of SPACES or a SPACE in the wrong place that has escaped your attention.

The UBIQUITOUS ZERO - Ubiquitous means: existing everywhere. The zero character looks like the capital letter "O" and it is everywhere. The confusion arises when we need to represent a zero, not the letter "O". So to eliminate the confusion, we will make the NUMBER ZERO like this: Ø

## THE HISTORY OF THE ELECTRIC PENCIL

During January of 1975 an article in Popular Electronics Magazine caught the eye of Michael Shrayer. It was about one of the then "new" hobby computers. He had just come to California, after a successful career as a commercial and industrial film director and camera man. Looking for a new challenge, he wrote the manufacturer, requesting more information.

Electronics was not a new interest to Michael, since he had been an avid amateur radio hobbyist (WA6SQW) most of his life. Computers might be something that would prove interesting. In a few weeks, the information on the computer, a MITS ALTAIR computer kit, arrived. It looked interesting and didn't seem too expensive. Michael made up his mind quickly and soon the MITS company had his money and Michael was the owner of a computer kit.

Its assembly went quickly. It was a large metal box and had no video, keyboard, or storage device. A program had to be keyed into the computer with a "front panel" consisting of switches and lights. When the "RUN" switch was pressed, the computer displayed its results with lights. It took several hours to "key in" a simple program. There was no way to "SAVE" it. Each time he wanted to run a new program, several hours had to be spent keying in a new program and debugging the mistakes that were a result of mis-keying.

In the beginning, he did not know machine code or how to write a machine language program so he had to be content with keying in a simple program, supplied with the computer, that made the computer play a song. After a three hour keying-in session, the computer would play "A Fool On The Hill". Michael was not thrilled with that for very long.

In 1975, the coming "computer boom" was not evident to most of us. It was a kind of underground movement with computer professionals, engineers and a few mavericks, like Shrayer. There is an old saw, that birds of a feather flock together. The computer birds sought each other out and organized into clubs.

Within a short time, Michael had added a paper tape punch to store and load programs, and a video screen and keyboard. The MITS was starting to look like a "real" computer. Soon he was buying and selling hardware, writing machine language programs and having a hell of a good time.

Michael had decided that "computers were fun" but by now he wanted to find some "useful task" that it could do. Something that would make it a truly VALUABLE tool, not just a gadget that would play a song.

All during this time, Michael had only used the computer to write programs that would assist him in writing other programs. His first editor-assembler program, purchased from Processor Technology, was called "SOFTWARE PACKAGE 1." To Michael's way of thinking, it needed some improvements. He made the improvements and called it "EXTENDED SOFTWARE PACKAGE 1." or "ESP-1". Now he had to write the documentation -- ON A TYPEWRITER!

Before this he had never heard of a word processor. It was a new idea to him and besides, he needed such a program for his own documentation chores. Tearing into the problem with a vengeance, in a few months he had a crude version of the PENCIL up and running on the ALTAIR. In a few more months, it was debugged.

The first job that Michael had THE ELECTRIC PENCIL do was to write THE ELECTRIC PENCIL documentation!

Michael had no idea that THE ELECTRIC PENCIL would result in his going into the business of selling his own software. The word spread and he was soon duplicating and selling THE ELECTRIC PENCIL word processing system. At that time, THE ELECTRIC PENCIL was the ONLY word processor available on a microcomputer and there was a clamor from owners of different machines, to make it available for their machines too.

From 1976 to 1980 seventy-eight versions of THE ELECTRIC PENCIL were written to run on various computers and under different operating systems. Just keeping up with all the different machines, let alone the various operating systems, began to take the "fun" out of having a computer for Michael.

Some of the computer companies went out of business eliminating the need for some versions of THE ELECTRIC PENCIL but others quickly took their place.

In late 1978 the TRS-80 entered the great computer race. In a short time, THE ELECTRIC PENCIL was, as they say in the computer world, "up and running" on the TRS-80, at first as a tape version and later as a disk version.

Shrayer continued to sell the package until January of 1981. By this time THE ELECTRIC PENCIL was losing ground to other word processors, not because they were better but because the market had changed. Michael was not ready to devote his life to the daily chores of marketing, accounting, advertising, and the thousand and one details of doing business around the world.

Harvard Pennington, an avid fan of THE ELECTRIC PENCIL and the president of IJG, Inc., proposed that IJG take over the job of supporting and marketing THE ELECTRIC PENCIL. Michael, seeing an opportunity to return to having "fun" with his computer, agreed.

IJG had a special interest in THE ELECTRIC PENCIL too. Pennington had used THE ELECTRIC PENCIL to write his book, "TRS-80 Disk and Other Mysteries". Pleased with how easy it was to use, he, like many others, had several versions modified to his own specifications by patching the PENCIL code. One was a "communications" version and another was a "typesetting" version. Each was used for special tasks.

The "communications" version permitted him to send and receive text over the telephone. The "typesetting" version allowed him to set type for IJG's budding publishing division. Pennington's plan was to have authors write their books on the TRS-80 using THE ELECTRIC PENCIL then send their text over the phone to IJG, where the text would be saved to disk. Now the text could be edited and worked on and when ready, the disks would be sent to the typesetter where type would be set directly from the disk using THE ELECTRIC PENCIL as the software interface between the TRS-80 and the type setting machine.

Knowing what the PENCIL was capable of and liking its easy-to-use command structure (which is particularly suited to authors and writers who want to create texts without spending hour on hour examining manuals, deciphering embedded codes and trying to figure out what the hell to do next) Pennington got together with a couple of THE ELECTRIC PENCIL fans and machine language programmers and planned the release of the current version. This version was to be assembled from source code, not simply patched in a haphazard way. Great care was taken to retain the essence of the original simplicity of commands and yet allow sophisticated text processing and print formatting. The task was undertaken and completed in record time.

And that, brings us to the present. Over five years of continuous use by tens of thousands have made THE ELECTRIC PENCIL the most popular word processor in use around the world.

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**SYSTEM HARDWARE REQUIREMENTS**

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The following is a list of the minimum equipment that is required to operate THE ELECTRIC PENCIL Word Processing System:

**TAPE SYSTEM:**

TRS-80 Level II Microcomputer MODEL I or MODEL III  
16K RAM memory (minimum)  
Cassette Recorder  
Radio Shack Expansion Interface (optional)  
Radio Shack RS-232 interface (optional)  
Small System Hardware TRS-232 Interface (optional)  
Serial or Parallel printer (optional)  
Lower case modification kit (optional)  
EXATRON Stringy Floppy (optional)

**STRINGY FLOPPY SYSTEM:**

TRS-80 Level II Microcomputer MODEL I or MODEL III  
16K RAM memory (minimum)  
EXATRON Stringy Floppy drive unit  
Radio Shack Expansion Interface (optional)  
Radio Shack RS-232 interface (optional)  
Small System Hardware TRS-232 Interface (optional)  
Serial or Parallel printer (optional)  
Lower case modification kit (optional)  
Cassette Recorder (optional)

**DISK SYSTEM:**

TRS-80 Level II, MODEL I or MODEL III  
32 K RAM memory (minimum)  
Radio Shack Expansion Interface  
1 Disk Drive (minimum - MODEL I)  
2 Disk Drives (minimum - MODEL III)  
Radio Shack RS-232 interface (optional)  
Small System Hardware TRS-232 Interface (optional)  
Serial or Parallel printer (optional)  
Lower case modification kit (optional)  
Cassette Recorder (optional)  
EXATRON Stringy Floppy (optional)  
Disk Operating System Software which may be  
any one of the following:

NEWDOS 2.1 (MODEL I)  
NEWDOS/80 1.0 (MODEL I)  
NEWDOS/80 2.0 (MODEL I)  
TRS-DOS 2.3 (MODEL I)  
NEWDOS/80 2.0 (MODEL III)  
TRS-DOS 1.2 (MODEL III)  
TRS-DOS 1.3 (MODEL III)

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LOADING INSTRUCTIONS

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THE ELECTRIC PENCIL is furnished on cassette for cassette users, disk for disk users and Stringy Floppy wafers for Stringy Floppy users. The instructions for getting the PENCIL running on your particular flavor of peripheral device, will be found in one of the three sections below.

MODEL I and MODEL III TAPE LOADING INSTRUCTIONS

You will notice that there is a MODEL I and MODEL III version of the program on each side of the cassette. The programs on each side of the tape are identical but each is recorded at a different baud rate. The MODEL III side is recorded at 1500 baud and the MODEL I side is recorded at 500 baud.

Each side of the tape contains two copies of the program about ten seconds apart. By playing the tape without the computer connected you may listen to the recording and determine the counter setting prior to attempting a LOAD.

Load the program tape using the SYSTEM command. Type "SYSTEM" and press <ENTER>. A star and question mark will appear (\*?). Prepare the tape and recorder to load the tape. Type the program name, which is PENCIL. When the <ENTER> key is pressed, the cassette will start running.

When the main program is reached on the tape, two stars will appear in the upper right of the screen. The right hand star will blink approximately every 4 seconds. If a tape error is detected, the left star will be replaced by a "C", indicating a checksum error, and the machine will usually hang up. This requires that you press the reset button to regain control of the keyboard. When a successful load is achieved, THE ELECTRIC PENCIL will now start running and you will see THE ELECTRIC PENCIL "billboard" on the video screen.

IN CASE OF DIFFICULTY

If your tape fails to load, first make sure the tape is recorded. If you cannot hear your tapes while they are loading, pull out the earphone plug and listen. Write down the tape counter settings where the sound begins and ends. There is a second copy of the program on each cassette, which starts about ten seconds after the end of the first copy. Be sure to write down the numbers on the counter, for both copies.

Nearly all tape loading difficulties can be resolved by adjusting the volume control on your tape recorder. Tapes usually load reliably using the Radio Shack CTR41 or the CTR80A recorder with the tone control in the high position and the volume control set between 6 and 7 1/2. Start with your control set for 7 1/2. If this doesn't work, try lowering the volume control by about 1/4 number division on the volume dial. Continue this procedure until you are able to load the tape. Level II tapes are very touchy; a change of 1/4 division in volume settings, can make a major difference in performance.

Usually volume control problems show up very quickly. This procedure should not take too long. Experiment with your tape and when it loads, write down the setting on the cassette label. Be sure to try both copies before giving up. If you are unable to load either copy of your program at any volume level, see APPENDIX III for replacement procedures.

You may modify your tape recorder so that you can hear it during record or playback operations. It is a simple matter to place a resistor (about 100 ohms; experiment to determine the proper volume level) across the speaker disable switch on the jack plug, inside the recorder. You will then be able to judge the proper volume level for your tapes, be able to tell when the tape starts and ends, and can sometimes hear a tape "dropout" problem when it occurs.

#### STRINGY FLOPPY LOADING INSTRUCTIONS

There are two ELECTRIC PENCIL programs recorded on the EXATRON STRINGY FLOPPY wafer. They are identical and are file numbers "1" and "2". The second recording is a "backup" copy of the first.

Before we can LOAD or SAVE programs and text on the Stringy, it has to be initialized so that the computer knows that it is out there, on the end of some cable. The initialization will also allow the computer to recognize the Stringy's commands.

Make sure your system is on and all of the peripheral devices are on. If you have a disk system, load "BASIC" from the "DOS READY" message. If you have a LEVEL II system, then you are already there.

Now, from BASIC'S "READY" message, type:

SYSTEM <ENTER>

and the computer will display:

\*?

enter the following:

\*? /12345 <ENTER>

and now you will have the EXATRON Stringy Floppy initialization message displayed on your screen like so:

EXATRON STRINGY FLOPPY VERSION 4.1

Now, load the EXATRON STRINGY FLOPPY wafer that contains THE ELECTRIC PENCIL program into the Stringy Floppy drive and type:

@LOAD1 <ENTER>

When the EXATRON STRINGY FLOPPY has completed its load, PENCIL will automatically begin running. The screen will clear and you will see THE ELECTRIC PENCIL'S billboard message. Now skip over the next few paragraphs to the "GETTING STARTED" part of this book. (Do not pass "GO", do not collect \$200.) If you have trouble loading file number one, try file number two on the same EXATRON STRINGY FLOPPY wafer and check all of your hardware for proper operation. (I have found the EXATRON STRINGY FLOPPY an extremely reliable device and have found most errors to be my fault and not those of the system. - H.C.P.)

### DISK LOADING INSTRUCTIONS

There are several program files on the distribution diskette. They are:

PENCIL/CMD - THE ELECTRIC PENCIL initialization file.

PENCIL01/SYS - An ELECTRIC PENCIL system file.

PENCIL02/SYS - An ELECTRIC PENCIL system file.

PENCIL03/SYS - An ELECTRIC PENCIL system file.

XFER/CMD - A special transfer program

Only the "PENCIL" files are "necessary" files. The "XFER/CMD" file is for transferring the Pencil files on two drive systems. Tape and Stringy Floppy versions of THE ELECTRIC PENCIL are a single program and do not have the same program structure as the disk version.

### ALL DISK DRIVE SYSTEMS

Turn on your computer and all of the peripheral devices such as disk drives and printer. Prepare a SYSTEM DISK with DOS on it (to put your ELECTRIC PENCIL master program files onto) by making a BACKUP copy of your DOS and KILLING ALL unnecessary files on the backup copy of the diskette. This diskette will become your MASTER diskette with THE ELECTRIC PENCIL program on it.

TRS-DOS users refer to the "BACKUP" command and NEWDOS users refer to the "COPY" command for making a duplicate diskette.

### SINGLE DISK DRIVE SYSTEMS (MODEL I SYSTEMS ONLY)

Once you have prepared your MASTER SYSTEM DISKETTE, remove it from the disk drive and insert THE ELECTRIC PENCIL DISTRIBUTION DISKETTE. Press the RESET button. The disk drive will start and you will see the following message:

PLACE MASTER SYSTEM DISKETTE IN DRIVE  
AND PRESS <ENTER>

After you have followed this instruction you will see:

PLACE ELECTRIC PENCIL DISTRIBUTION DISKETTE  
IN DRIVE AND PRESS <ENTER>

This process will continue until all of the files on THE ELECTRIC PENCIL DISTRIBUTION DISKETTE have been transferred to your MASTER BACKUP DISKETTE. Remove the disk from the drive and place a WRITE PROTECT tab over the square notch, on the side of the diskette. Now, with the MASTER BACKUP disk in the drive, press the RESET button and when the DOS READY message appears make a WORKING DISK from your MASTER DISKETTE.

Be sure that you WRITE PROTECT this diskette and file it away in a safe place. Then if something happens to your WORKING DISK, you will always be able to make a new copy.

Place your WORKING DISK into the drive and now you are ready to RUN THE ELECTRIC PENCIL. From the DOS READY message type:

PENCIL <ENTER>

The next thing you will see is THE ELECTRIC PENCIL'S billboard message on your screen. You are now ready for the "GETTING STARTED" chapter on page 14.

SINGLE DRIVE SYSTEMS - (MODEL III SYSTEMS)

THE ELECTRIC PENCIL is distributed on single density, 35 track, Model I format diskettes only. Since there is no single drive CONVERT program for the Model III, the only way to copy your programs to a Model III single disk system is to have a friend with a two drive system make the transfer for you. We apologize for this unfortunate inconvenience, but the complexity of supporting every configuration of two machines of several disk operating systems is just not possible.

MULTIPLE DRIVE SYSTEMS (MODEL I ONLY)

Once you have prepared your MASTER SYSTEM DISKETTE, insert it into the SYSTEM DRIVE (drive zero). Place THE ELECTRIC PENCIL DISTRIBUTION DISKETTE into drive one. From the "DOS READY" message type:

XFER <ENTER>

THE ELECTRIC PENCIL will be transferred from the distribution diskette on drive one, to your MASTER DISKETTE on drive zero, without any further action on your part. Once the transfer process is complete, make a WORKING DISK from your MASTER DISKETTE.

Be sure to WRITE PROTECT this diskette and file it away in a safe place. Then if something happens to your WORKING DISK, you will always be able to make a new copy.

Place your WORKING DISK into the drive zero and you are now ready to RUN THE ELECTRIC PENCIL. From the DOS READY message type:

PENCIL <ENTER>

The next thing you will see is THE ELECTRIC PENCIL'S billboard message on your screen. You are now ready for the "GETTING STARTED" chapter on page 14.

MULTIPLE DRIVE SYSTEMS (MODEL III)

If you are using TRSDOS, use the CONVERT utility to transfer all of the PENCIL files from drive one to drive zero and KILL the XFER/CMD file, on drive zero, as it is not used on the Model III

If you are using NEWDOS/80, redefine drive one as a single density drive with the PDRIVE command and simply copy the ELECTRIC PENCIL files to drive zero. Type the following PDRIVE parameters:

PDRIVE,0,1,TD=A,SPT=10 <ENTER>

Do not forget to reset your PDRIVE parameters to TD=E and SPT=18 for double density operation.

=====

GETTING STARTED RIGHT NOW!

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If you are an old hand at the "THE PENCIL" and have a good working knowledge of the computer and word processing, chances are that you don't want to wade through this book to find out every new feature - you want to get up and running right now and learn about the bells and whistles later.

It is assumed that anyone reading this section is familiar with the computer and how to load and execute programs so we have not included the steps concerning the details of these operations. Any questions, so far?

"What's different about this release of THE ELECTRIC PENCIL and previous releases?"

Glad you asked about that - as far as the general operation is concerned, very little. None of the text entry commands have been altered in their functions but a few, those which were also assigned to other keys, such as control-w for up-arrow and control-m for the "ENTER" key, for instance, were simply deleted.

The SYSTEM MENU has been changed quite a bit. The system commands are now displayed and the print commands have been put into their own menu, the PRINT MENU which is entered with the command <CONTROL>-<P>.

All of the file handling commands have been changed to their normal-every-day TRS-80 type commands. "DL", disk load, is now just plain "LOAD" and tape read, formerly "R" is now "CLOAD". Since all of the commands are displayed in logical groups you will not have any trouble finding the command you want to use.

The PRINT MENU has some new innovations that will make setting up your print formatting a breeze. Once again, we grouped all of the functions together that had the same logical purpose. The format commands are on the left, the printer control commands on the right and the active print driver below. The print commands have been changed to two letter commands with the initials of the command as the actual command. "PL" is page length and "PS" is page spacing, for example. All of the commands are displayed so you can find what you are looking for without referring to this manual.

We have removed the limitations on print values and have made all the printer control settings so they can be reset once they have been set. For those of you with serial printers, you can now set your RS232c UART and TRS-232 settings from within the PRINT MENU. Baud rates now include all of the standard settings from 110 to 9600 baud.

If you get stuck on anything, you can get specific answers from this manual. Besides the table of contents, there are 3 sub-contents pages that cover the three main sections:

TEXT ENTRY ..... page 17  
SYSTEM MENU ..... page 47  
PRINT MENU ..... page 68

A quick reference to these sub-contents pages will point you to the exact page that will answer any questions you have about any particular command. You will also find a QUICK REFERENCE CARD as the very last page of this manual. Of course there is additional information that you should be aware of but, you can get around to that at your leisure. You will also notice that THE ELECTRIC PENCIL is "bullet proof" - it is virtually impossible to cause a "blow it up" or "hang" as a result of anything you enter, load from disk, tape or stringy once the PENCIL is running. Now let's get going.

**DISK USERS:**

1. Transfer the programs on the distribution disk onto a system disk. (If you have a one drive system, you can refer to page 10 for the procedure.)
2. Boot the system disk with the PENCIL programs on it and from "DOS READY" type: PENCIL<ENTER>
3. Go to the paragraph titled "RUNNING", below.

**TAPE USERS**

1. Make sure everything is connected and set.
2. From BASIC's "READY" mode, type: SYSTEM<ENTER>
3. From the prompt, "\*?" type: PENCIL<ENTER>
4. The tape will begin loading. If you have trouble, refer to page 8.
5. Go to the paragraph titled "RUNNING", below.

**STRINGY FLOPPY USERS.**

1. Insert the wafer into your Stringy Floppy drive.
2. Make sure the Stringy Floppy has been initialized with the "/12345" command.
3. From BASIC's "READY" mode, type: @LOAD1<ENTER>
4. Go to the paragraph titled "RUNNING", below.

**RUNNING**

At this point you have THE ELECTRIC PENCIL'S billboard message on the screen. Press any key. The billboard will disappear and a solid white cursor will appear in the upper left corner of the video display. As soon as it starts to flash, in a second or two, you may start entering your text.

Each key you press will appear on the display the instant you press the key. When you reach the end of a line on which a word will not fit in its entirety, the word will be shifted down to the next line.

DO NOT press the <ENTER> key until you get to the end of a paragraph or wish to make a blank line.

Editing of the text is accomplished by pressing the control key (CLEAR) and the appropriate letter key AT THE SAME TIME. A list of the CONTROL functions are on page 17 and the QUICK REFERENCE CARD.

To save the text to tape, wafer or disk, go to the SYSTEM MENU by pressing CONTROL-K (the control key is the "CLEAR" key). Issue the proper save command for tape, wafer or disk.

CAUTION: the text will be SAVED from the cursor position to the end of the file. Any text preceding the cursor will NOT BE SAVED!

To print the file on your line printer, go to the PRINT MENU by pressing CONTROL-P. Press the <ENTER> key and the text will immediately be printed. To print more than one copy of a file on the printer, enter the number of times you wish to print and then press <ENTER>.

Remember, this section is not MEANT to be a complete instruction course for THE ELECTRIC PENCIL. Its purpose is to get those of you who have enough knowledge about the computer and THE ELECTRIC PENCIL up and running as fast as possible with as little instruction as possible.

=====

GETTING STARTED

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When you have successfully loaded THE ELECTRIC PENCIL and the program is running, the screen will clear and THE ELECTRIC PENCIL'S billboard message will appear.

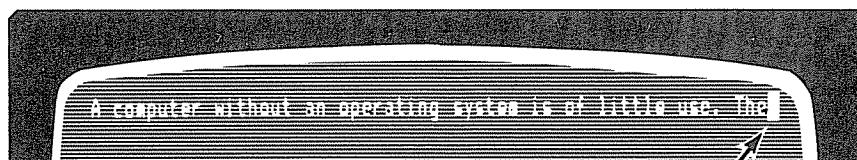
figure 1

NORMAL PROGRAM OPERATION

Press ANY key and the billboard message will disappear and a flashing white cursor will appear in the HOME or upper left hand corner of the screen.

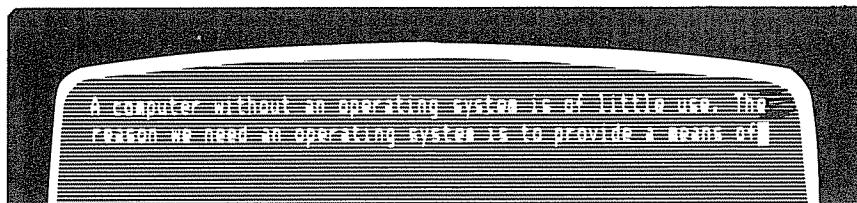
A text file may now be started by typing your text. If you have the lowercase kit installed (or a MODEL III machine) type <SHIFT>-<BREAK> or <SHIFT>-<Ø> to turn on the lowercase. A second <SHIFT>-<BREAK> or <SHIFT>-<Ø> will toggle (meaning to switch from one mode to another) the keyboard to uppercase only. Any key, after being held down for about 1/2 second, will repeat at a rate of about ten characters per second with the SYSTEM MENU.

Type in the following text:



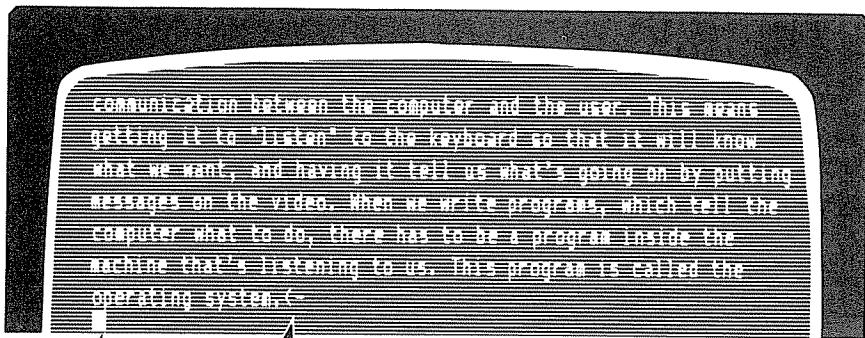
The cursor is now at this position

Press the <SPACE BAR> and continue typing:



When you typed, "reason" you would have seen THE ELECTRIC PENCIL shift the word down to the next line. This is because it would not fit onto the line we were currently working on. This makes the text easier to read and work on. If THE ELECTRIC PENCIL did not do this, the text would be VERY hard to read. You also noticed, no doubt, that we did not have to press the <ENTER> key when we reached the end of the line.

Now, continue typing in this text. DO NOT PRESS <ENTER> UNTIL YOU SEE THE INSTRUCTION TO DO SO! We'll use this file later on to demonstrate some of the features of THE ELECTRIC PENCIL.



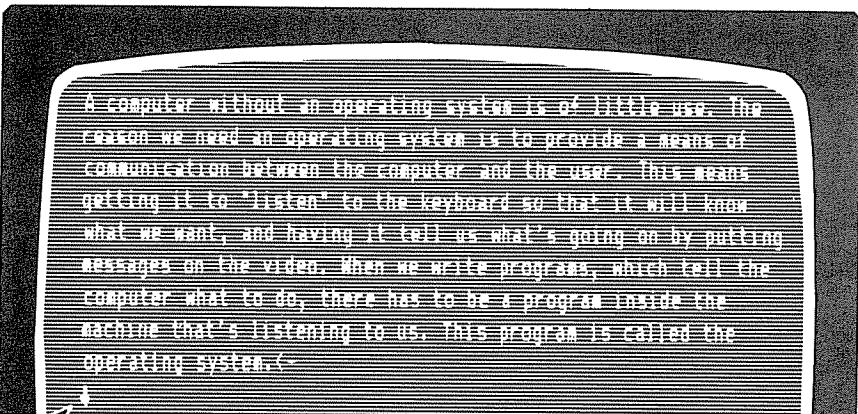
When you get to this point, press the <ENTER> key and the "carriage return" symbol will be placed here.

The cursor will position itself here, ready to start a new line.

Note that <ENTER> is not used at the end of each line and that any partially completed word that would not fit on the line, was brought down, to the next line and a new line was started.

Typing proceeds normally until the end of a paragraph is reached. At this point, <ENTER> is used to terminate the paragraph or record. A left-arrow (<-) appeared on the screen at the end of the line, and the cursor advanced to the beginning of the next line. Any additional <ENTER>s will insert blank lines after the paragraph.

If this is to be the end of a PRINTED page, and you do not want the program to wait until the page length parameter (PLnn) is reached, you may FORCE a FORM FEED by entering a <SHIFT>-<†>. Your text will look like this:



This is the FORM FEED character.  
(A diamond on MODEL III machines.)

The FORM FEED will cause the printer to eject one page and start a new page. On a MODEL I computer this is a down arrow, as shown and on the MODEL III it is a diamond character (◆).

Whenever a specific number of spaces within a line are essential, the line must be terminated by an <ENTER>. This is because lines are not delineated and may be broken up at any point during printing. Exactly where a line will end is determined by the line length that you select prior to printing.

Experimentation and imagination will bring about almost any desired results in the final printing of text.

=====

THE ELECTRIC PENCIL OPERATING INSTRUCTIONS

=====

THE ELECTRIC PENCIL has three modes of operation. The first is the TEXT ENTRY mode, the second is the SYSTEM MENU mode and third is the PRINT mode.

In the TEXT ENTRY mode you will be able to enter, edit, and move the text. From the SYSTEM MENU you can SAVE and LOAD text files to tape, Stringy Floppy wafer or diskette, depending on your system. You will also be able to determine the amount of free memory you have left, the number of words you have used, selectively clear text from memory and set the cursor speed.

In the PRINT mode you may set the PRINT VALUES, select the printer output ports and cause the file to be printed on the line printer any number of times.

The TEXT ENTRY mode is entered immediately after you press any key while THE ELECTRIC PENCIL's "billboard" message is displayed. Text may be entered as soon as the flashing cursor appears. Cursor control, editing functions, special characters, utility functions and special purpose functions are entered by pressing the "control" key and a letter key or the "shift" key and a letter key, depending upon the exact function desired.

The operation of the program is simple and straight forward. It performs as you would expect it to. When you press the up-arrow key, the cursor moves up. It does NOT move out of its track, or go to the beginning of the line; it moves as you would expect it to; up. The <BREAK> key will "break", "abort" or "halt" any operation or function. There is NOT one key that will "break" some functions and another key to "break" others. One simple key-stroke does it all.

The commands are as simple as possible and require as few key strokes as possible. The commands, issued from the menus, use a mnemonic (a word meaning "memory aid" - see GLOSSARY) that corresponds to the device or function. For instance, CLOAD, CSAVE and CLOAD? are the normal TRS-80 mnemonics used to "read", "write" and "verify" cassette tapes. THE ELECTRIC PENCIL uses these same mnemonics. Mnemonics for the PRINT MENU functions use the first letters of the function's name for its mnemonic. LINE SPACING is LS, CARRIAGE RETURN ON/OFF is CR, RIGHT JUSTIFY is RJ, and so on. The number of things you are required to remember is very small. In fact, you could say that if you know what you want to do, you know the command, i.e., to set the LINE LENGTH to 70 characters the command is: LL70.

RECOVERING FROM AN ACCIDENTAL EXIT

It is possible to re-enter THE ELECTRIC PENCIL after an accidental exit or "boot", providing the program code and file area is undisturbed.

TAPE and STRINGY FLOPPY SYSTEMS: THE ELECTRIC PENCIL'S restart address is 5BA0 hex; 23456 decimal. From level II BASIC, type: SYSTEM <ENTER>

The computer will respond with: \*? Now type: /23456 <ENTER>

You will immediately re-enter ELECTRIC PENCIL'S text input mode. If "garbage" appears on the screen or the computer "hangs", then the memory was "zapped" and you will have to restart the program and re-enter the text.

DISK SYSTEMS: THE ELECTRIC PENCIL disk systems have a built-in "restart utility". From the "DOS READY" mode, type: PENCIL \* <ENTER>

If the program is able to restart, you will return to the "billboard" message. Press any key to return to the text input mode. If the program is unable to restart a message will appear. If the tape and Stringy Floppy versions will not restart you will have a program "hang" or "garbage" will appear on the screen.

TEXT ENTRY MODE COMMANDS AND THEIR FUNCTIONS

Control Character Commands require that the CONTROL key (CLEAR for MODEL III and unmodified MODEL I machines) AND the specified alphabetic character key be depressed AT THE SAME TIME! Control Characters will not appear on the video display. Special characters generated by pressing control keys, such as the underline character, form feed, and carriage return character, will appear on the display.

The TEXT ENTRY mode commands are grouped into 5 groups; (1) The Cursor Control Functions, (2) Editing Functions, (3) Utility Functions, (4) Special Purpose Functions and (5) Special Characters. The following table is a list of the TEXT ENTRY mode commands and functions.

COMMAND TYPE	COMMAND	FUNCTION	PAGE
CURSOR CONTROL FUNCTIONS	<↔> .....	CURSOR LEFT .....	18
	<→> .....	CURSOR RIGHT .....	19
	<↑> .....	CURSOR UP .....	20
	<↓> .....	CURSOR DOWN .....	21
	<CTL>-<Q> .....	CURSOR HOME .....	22
	<CTL>-<N> .....	CURSOR to FILE END .....	23
	<CTL>-<B> .....	CURSOR to FILE BEGINNING .....	24
	<CTL>-<E> .....	SCROLL UP (forward) .....	25
	<CTL>-<X> .....	SCROLL DOWN (backward) .....	25
	<SHIFT>-<CLEAR> .....	CURSOR TO BEGINNING OF LINE ....	26
EDITING FUNCTIONS	<SHIFT>-<→> .....	TAB RIGHT 8 SPACES .....	27
	<CTL>-<D> .....	DELETE CHARACTER .....	28
	<CTL>-<F> or <CTL>-<I> ..	INSERT CHARACTER .....	29
	<CTL>-<Y> .....	DELETE LINE .....	30
	<CTL>-<G> .....	INSERT LINE .....	31
	<CTL>-<T> .....	ERASE to END of LINE .....	32
	<CTL>-<U> .....	DELETE BLOCK .....	33
	<CTL>-<H> .....	INSERT BLOCK .....	33
	<SHIFT>-<↑> .....	BLOCK MARKER CHARACTER .....	34
	<SHIFT>-<↔> .....	BACKSPACE & ERASE .....	35
UTILITY FUNCTIONS	<CTL>-<V> .....	STRING SEARCH .....	39
	<CTL>-<C> .....	CONTINUE SEARCH .....	40
	<CTL>-<R> .....	REPEAT FUNCTION .....	42
	<CTL>-<K> .....	SYSTEM MENU .....	43
	<CTL>-<P> .....	PRINT MENU .....	43
SPECIAL PURPOSE FUNCTIONS	<BREAK> .....	ABORT & EXIT CURRENT MODE .....	44
	<CLEAR> .....	"CONTROL" KEY .....	44
	<SHIFT>-<∅> .....	UPPER/LOWER CASE LOCK .....	44
	<SHIFT>-<BREAK> .....	UPPER/LOWER CASE LOCK .....	44
	<SHIFT>-<ENTER> .....	DICT-A-MATIC ON/OFF .....	44
SPECIAL CHARACTERS	<SHIFT>-<↓> .....	FORM FEED .....	36
	<ENTER> .....	TERMINATE RECORD (line feed) ...	36
	<CLEAR>-<∅> .....	UNDERLINE CHARACTER .....	36
	<CTL>-<SPACE> .....	HARD SPACE CHARACTER .....	37
	<CTL>-<→> .....	CONCATENATE CHARACTER .....	38

Special SEARCH & REPLACE characters (see pages 39-41):

<SHIFT>-<↔> .....

<SHIFT>-<↓> .....

<CTL>-<↔> .....

<CTL>-<↔> .....

<ENTER> CHARACTER

FORM FEED CHARACTER

"WILD CARD" CHARACTER

"NULL" CHARACTER

=====

**CURSOR CONTROL COMMANDS**

=====

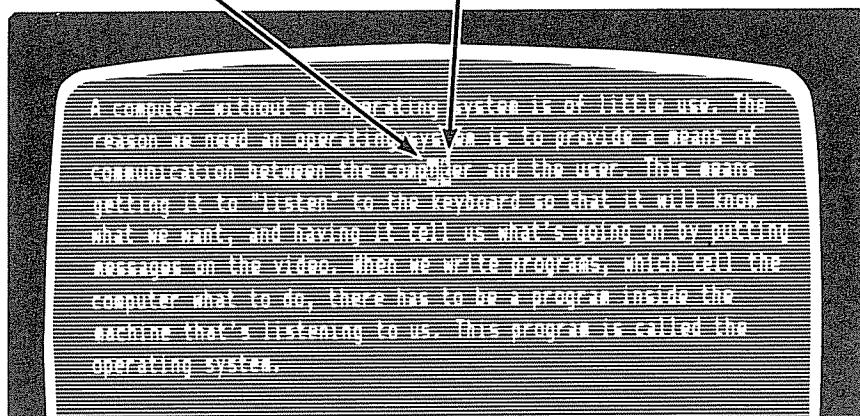
If you hold down a cursor motion key (or any other key), it will begin to repeat at about ten characters per second after a half second delay. This feature may be used to rapidly position the cursor anywhere on the screen. The repeat function rate can be set to as high as 34 characters per second with the CURSOR SPEED command, from the SYSTEM MENU.

**CURSOR LEFT <-->**

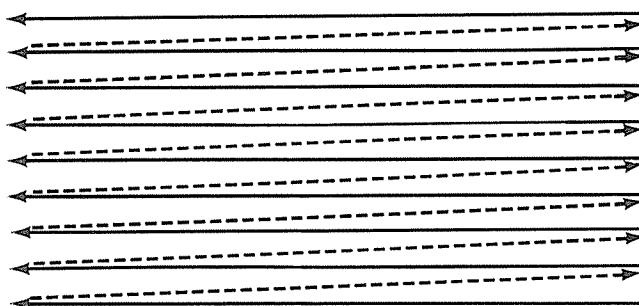
Pressing the <--> key will cause the cursor to move from right to left.

With the cursor here, pressing  
<--> will cause it to...

...move to here



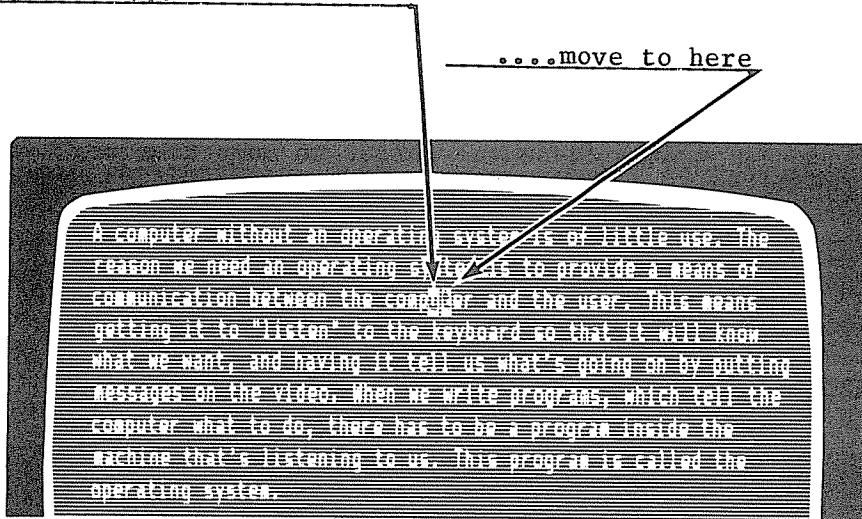
When moving the cursor to the left, its movement will continue to the end of the line above it when it encounters the beginning of the current line. If text exists above the top line of the display, holding the left arrow key will cause the text to scroll down one line before the cursor wraps up to the end of the next upper most line. This action will continue until the beginning of the file is encountered. Cursor motion is as depicted below:



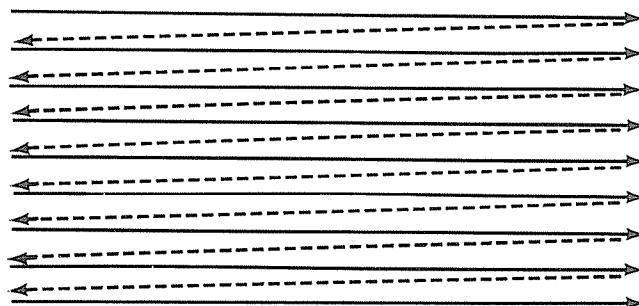
CURSOR RIGHT <→>

Pressing the <→> key will cause the cursor to move from left to right.

With the cursor here, pressing <→>  
will cause it to ...



When moving the cursor to the right, its movement will continue to the beginning of the line below it when it encounters the end of the current line. If text exists below the lower most line of the display, holding the right arrow key will cause the text to scroll up one line before the cursor wraps down to the beginning of the next lower most line. This action will continue until the end of the file is encountered. Cursor motion is as depicted below:

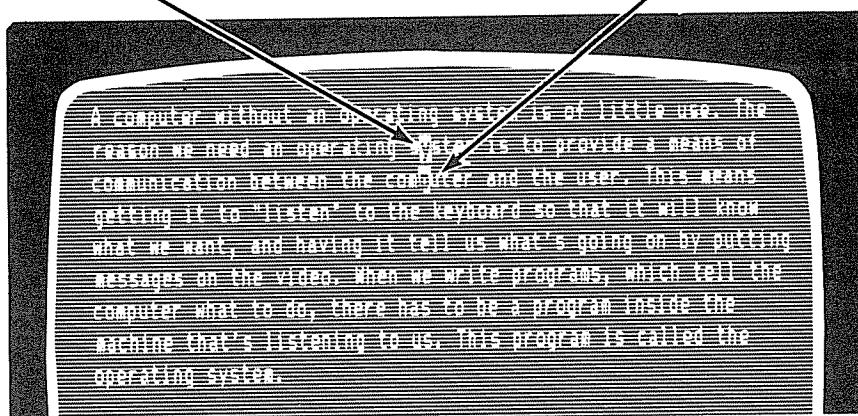


CURSOR UP <▲>

Pressing the <▲> key will cause the cursor to move upward, toward the top of the file.

With the cursor here, pressing <▲> will cause it to...

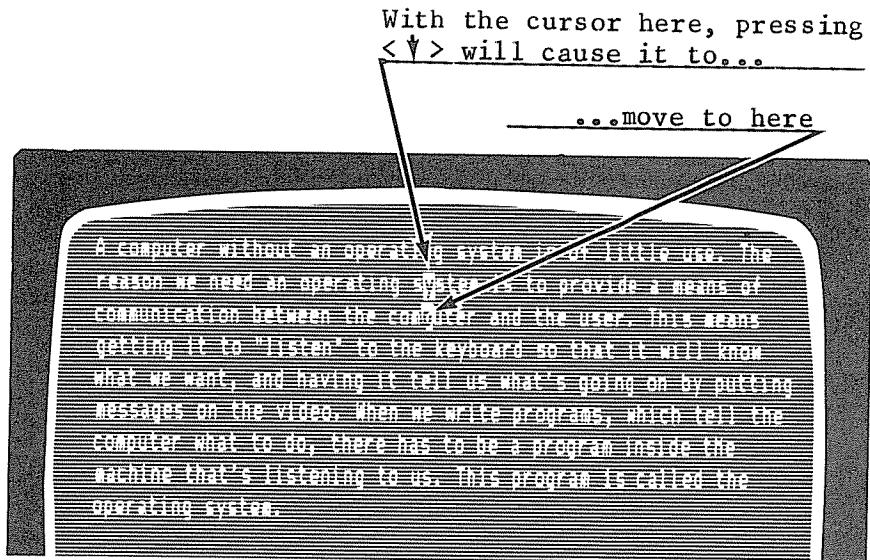
....move to here



When moving the cursor up, its movement will continue until the cursor encounters the top line of the display. At that time, if text exists above the upper most displayed line, the text will be scrolled down (effectively moving the cursor up) through the text. This action will continue until the beginning of the file is encountered. The cursor will move vertically in the same "track" or column.

CURSOR DOWN <▼>

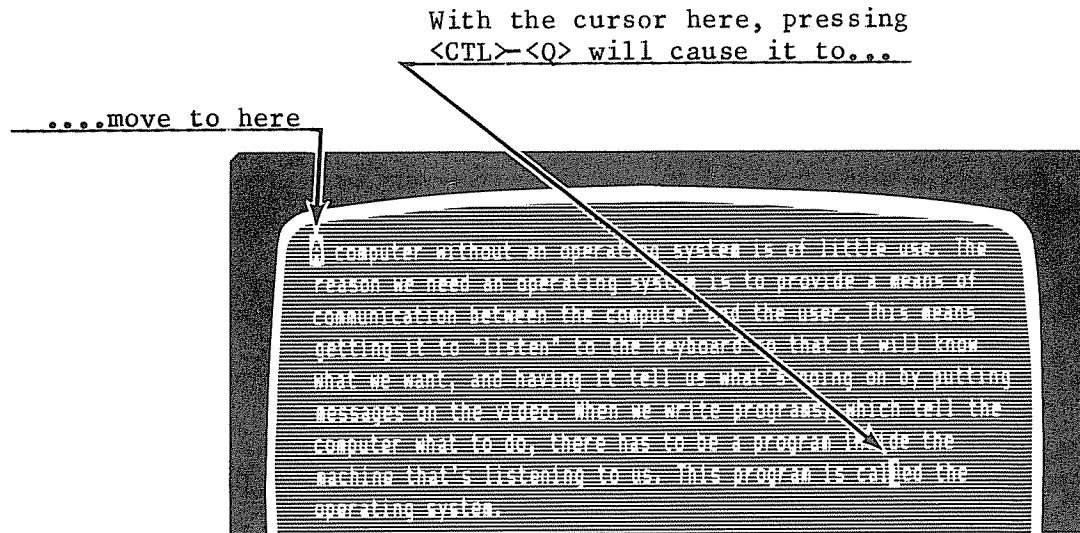
Pressing the <▼> key will cause the cursor to move downward, toward the end of the file.



When moving the cursor down, its movement will continue until the cursor encounters the bottom line of the display. At that time, if text exits below the lower most displayed line, the text will be scrolled up (effectively moving the cursor down) through the text. This action will continue until the end of the file is encountered. The cursor will move vertically in the same "track" or column.

CURSOR HOME<CTL>-<Q>

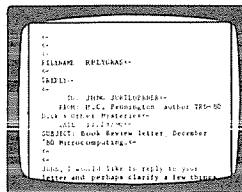
Pressing the <CTL> key and the <Q> key will cause the cursor to move to the upper left corner of the video display.



The cursor may be at any position on the screen. This command does not cause the text that is displayed to be scrolled or moved in any way.

CURSOR TO FILE END <CTL>-<N>

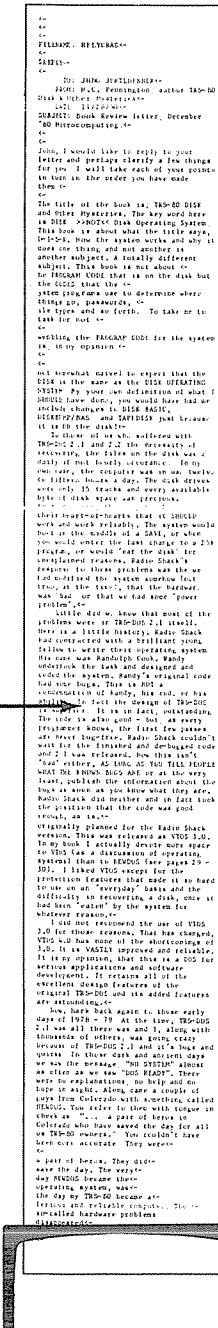
Pressing the <CTL> key and the <N> key will cause the cursor to move to the end of the file. If the file has more text than will fit on the video display, the screen will appear blank - simply press the <↑> key and the text will scroll down into view.



Press <CTL>-<N>

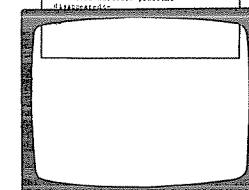


The file will move,  
in the display, from  
here...



File

...to here.



Press the <↑> key  
and the text will  
scroll into view.



CURSOR TO FILE BEGINNING <CTL>-<B>

Pressing the <CTL> key and the <B> key will cause the cursor to move to the beginning of the file.

Press <CTL>-<B>

The file will move,  
in the display, from  
here...  
.

SCROLL UP<CTL>-<E>

Pressing the <CTL> key and the <E> key will cause the text file to SCROLL upward.

SCROLLING is the action of the text moving up or down the video display. More than 16 lines of text (one page) must exist in the file for this action to occur. The cursor will disappear from the screen during a scroll.

SCROLL DOWN<CTL>-<X>

Pressing the <CTL> key and the <X> key will cause the text file to SCROLL downward.

SCROLLING CONTROL

Scrolling speed may be controlled by typing the numerals <1> through <5> WHILE scrolling. <1> is the fastest speed, and <5> is the slowest.

Further control is provided by the <SPACE BAR>, which temporarily halts the scroll. Continued pressing of the <SPACE BAR> will scroll one line at a time in the direction selected.

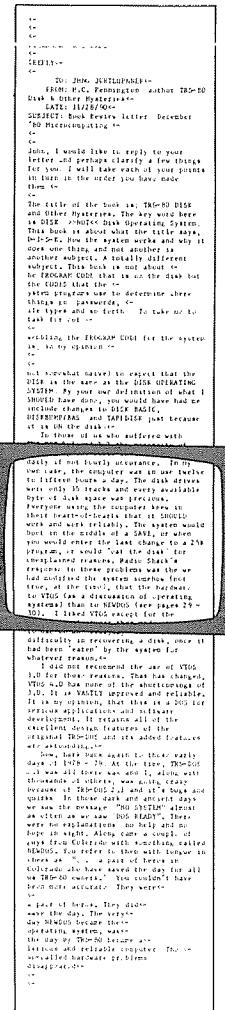
The <ENTER> key will continue the scroll after it has been halted by the <SPACE BAR>. When the end of the file is reached or when <BREAK> is pressed, the scrolling will stop and the cursor will reappear on the screen.

SCROLL SPEED CONTROL

- 1 = Fast
- 2 = Medium Fast.
- 3 = Medium
- 4 = Medium Slow
- 5 = Slow

SCROLL COMMANDS

- <SPACE BAR> = Freeze Scrolling.
- <SPACE BAR> = Scroll 1 line in direction selected.
- <ENTER> = Continue scroll after freeze.
- <BREAK> = Abort scrolling at current position.

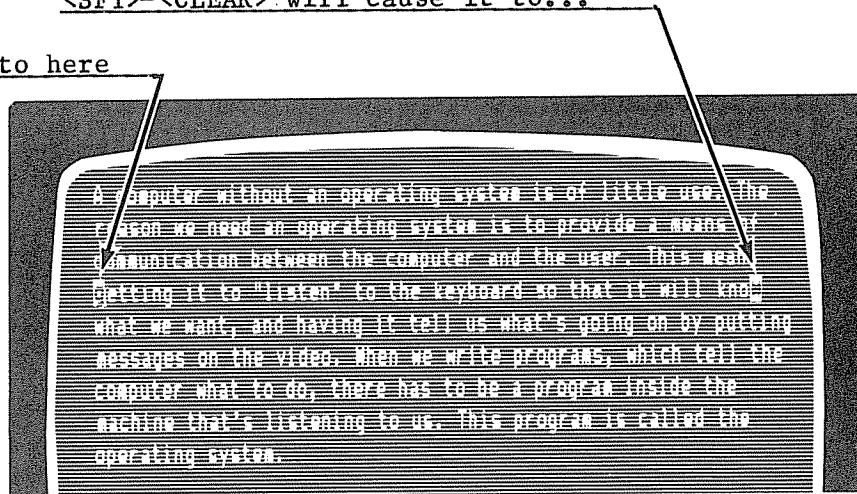


CURSOR TO BEGINNING OF LINE <SHIFT>-<CLEAR>

Pressing the <SHIFT> key and the <CLEAR> key will cause the cursor to go from its present position on a line to the beginning of that line.

With the cursor here, pressing  
<SFT>-<CLEAR> will cause it to...

....move to here



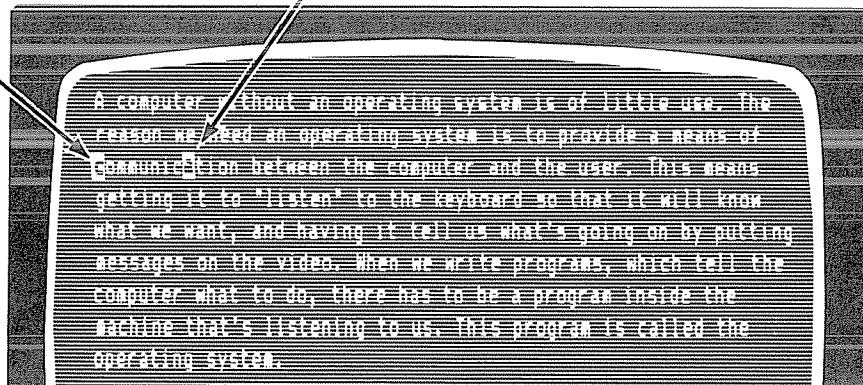
The cursor may be at any position on the line.

TAB RIGHT 8 SPACES      <SHIFT>-<=>>

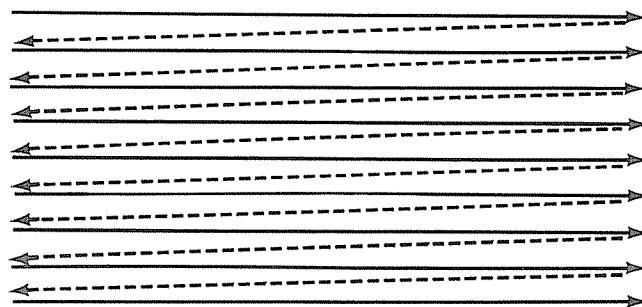
Pressing the <SHIFT> key and the <=>> key will cause the cursor to tab to the right eight spaces. It may be used as an "express" key to quickly move across the screen as well as for its normal function of tabbing 8 spaces to the right.

With the cursor here, pressing  
<SFT>-<=>> will cause it to...

.....move to here



When moving the cursor to the right, its movement will continue to the beginning of the line below it when it encounters the end of the current line. If text exists below the lower most line of the display, holding the tab right keys will cause the text to scroll up one line before the cursor wraps down to the beginning of the next lower most line. This action will continue until the end of the file is encountered. Cursor motion is as depicted below:



=====

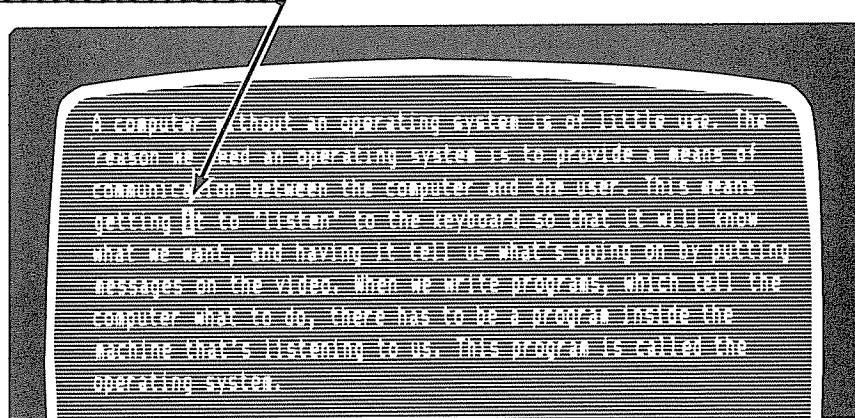
## EDITING COMMANDS

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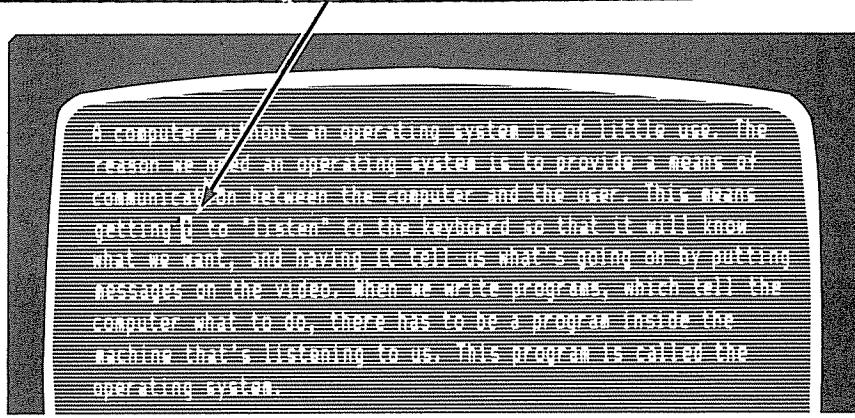
### DELETE CHARACTER      <CTL>-<D>

<CTL>-<D> is used to delete a character from the text. The cursor is placed over the character to be deleted and <CTL>-<D> is typed. The entire text then moves towards the cursor one position. Multiple deletions are also possible from any location by deleting one character or space at a time.

With the cursor here, pressing  
<CTL>-<D> will cause ...



...the text on the current line to move back  
one space.



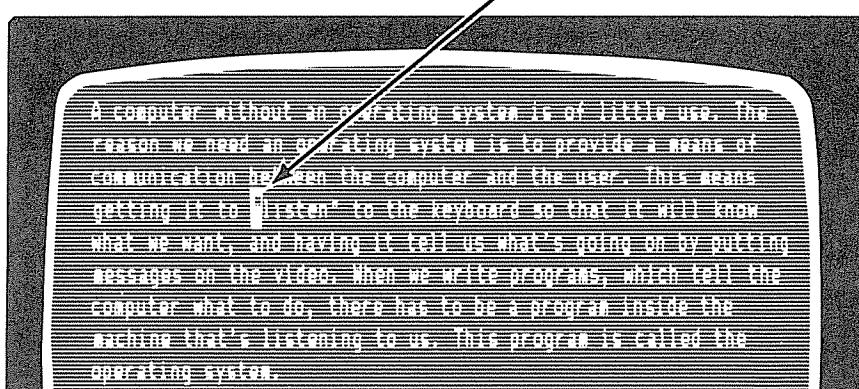
If you continue to hold down the <CTL> and <D> keys, letters will continue to be deleted and all of the text will be moved up to compensate for the deleted letters.

INSERT CHARACTER<CTL>-<F> or <CTL>-<I>

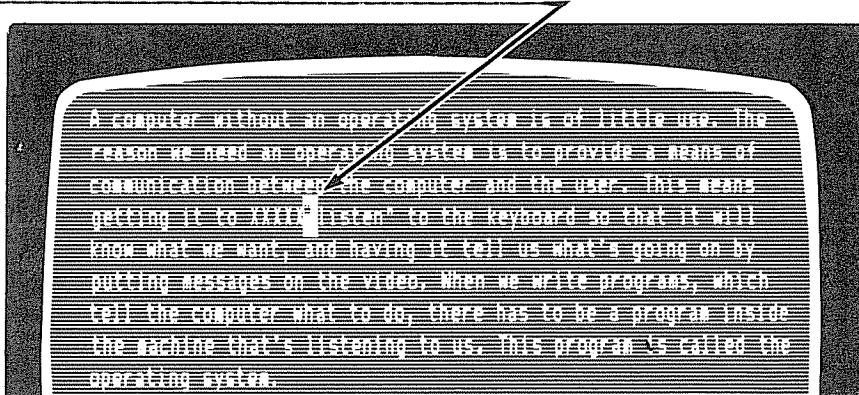
The Electric Pencil is normally in an "over-write" mode. This means that any character typed will appear wherever the cursor is located. If there is a character at the current cursor position, the new character typed will replace the existing one. By typing <CTL>-<F> or <CTL>-<I>, the INSERT mode is entered. The size of the cursor will increase to warn you that the system is now in INSERT mode. While in the INSERT mode any character typed will automatically shift the entire text to the right and insert the new character at the cursor position.

Typing <BREAK> or <CTL>-<F> or <CTL>-<I> while in the INSERT mode or leaving the current line will exit the INSERT mode and the cursor will assume its normal form. When the end of a line is reached while in the INSERT mode (or even while in the normal over-write mode), an entire line will be opened up to allow for additional character insertion. If a line is only partially filled, <CTL>-<D> will pull up the rest of the text to the cursor.

With the cursor here, pressing <CTL>-<F> or <CTL>-<I> will change the cursor size and place the program into the INSERT mode.



Now with program in the insert mode type: XXXXX  
The text will look like this:

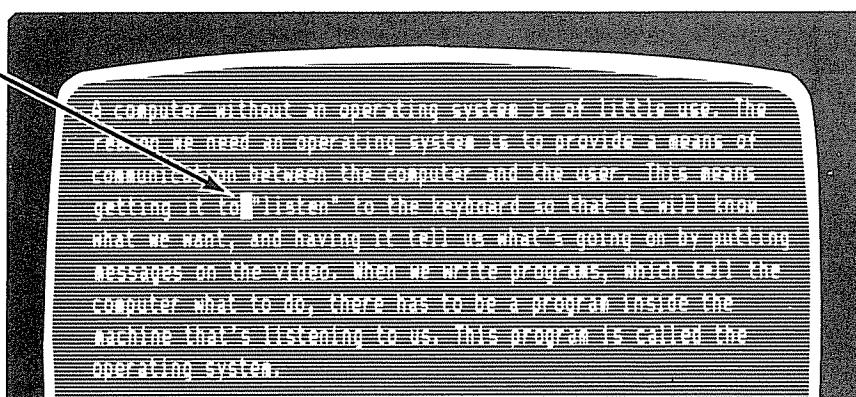


Notice that the text is shifted down when the last word, of the line, will no longer fit onto the line we are performing the insert function upon.

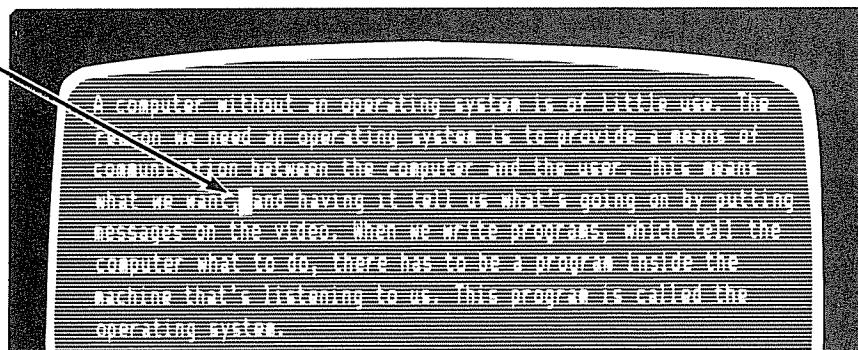
DELETE LINE<CTL>-<Y>

<CTL>-<Y> will delete whatever line the cursor is currently on. The text below the deleted line will be moved up one line.

With the cursor here, pressing  
<CTL>-<Y> will cause the current...



...line, that the cursor is on, to be deleted and the text that is below the current line, to be moved up one line



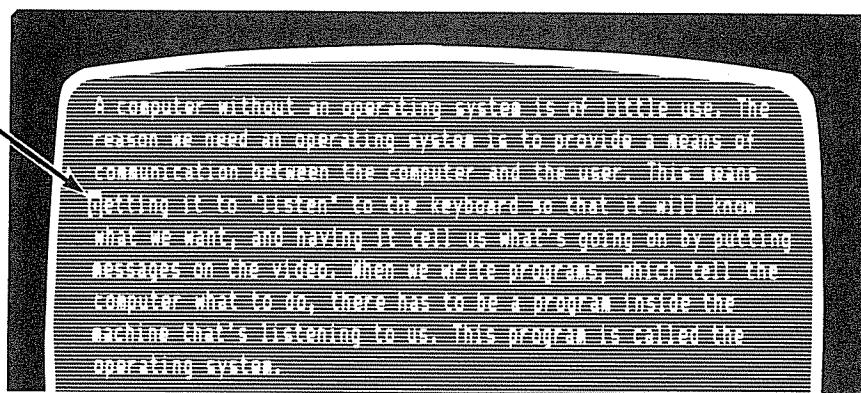
The cursor may be at any position on the line. When the line is deleted, the cursor position will not be changed.

INSERT LINE      <CTL>-<G>

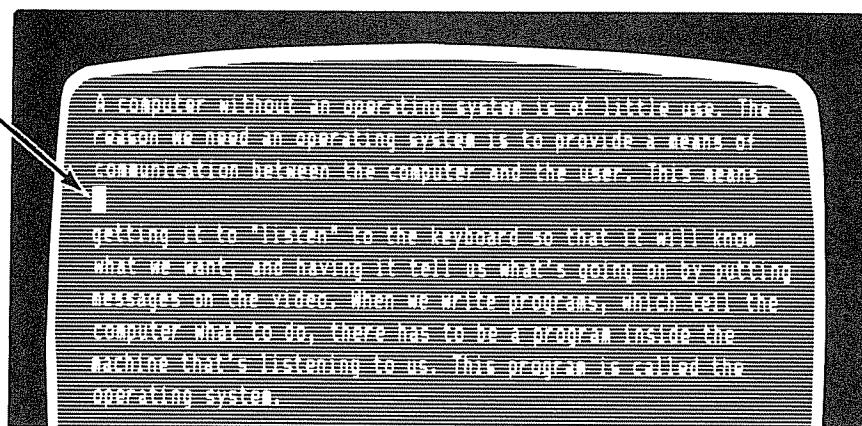
<CTL>-<G> will move the line that the cursor is currently on down one line. The cursor will position itself at the beginning of the empty line you have just created. Text may now be typed in as needed. When the end of the line is reached, another <CTL>-<G> will automatically be entered by the system, allowing you to continue entering text without interruption.

If you move the cursor off the "insert line", the text will be moved up next to the text you have entered.

With the cursor here, pressing  
<CTL>-<G> will cause the current...



...line to be moved down and the cursor to go to the beginning of the new line.

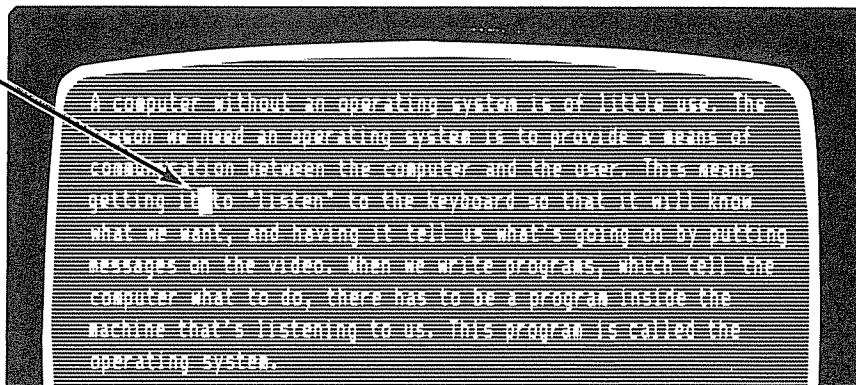


Once you have opened up a "new line", THE ELECTRIC PENCIL will continue in the "new line" mode. Each time you fill a line, a "new line" will be opened up until you press <ENTER> or move the cursor off the line and then the text will be moved up, next to your new text.

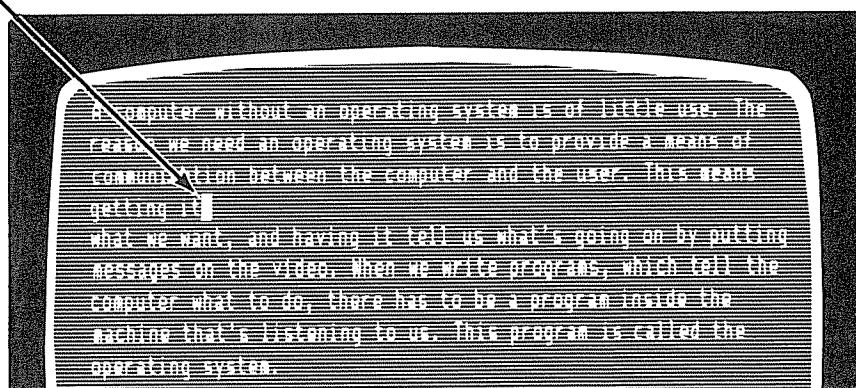
ERASE TO END OF LINE      <CTL>-<T>

<CTL>-<T> erases all text from the current cursor position to the end of the current line.

With the cursor here, pressing  
<CTL>-<T> will cause...



...the current line to be erased from  
the cursor position to the end of the line.



Only the text AFTER the cursor, on the current line is affected.

DELETE BLOCK      <CTL>-<U>

<CTL>-<U> will delete a block that has been correctly marked as stated below. The block markers are deleted during this action. If a block is incorrectly marked or not marked at all, "MARKER ERROR" will appear on the video display.

BLOCK MOVEMENT of TEXT

A "block" is any amount of text as small as one character or as large as an entire file. It may be a word, a sentence, a paragraph or a group of paragraphs. To move a block of text from one part of the file to another part of the file or to delete a block of text, it must first be MARKED. The character used to mark the boundaries of a block is a graphic character in the form of a vertical bar. This character is also called a "marker".

To mark the boundaries of a block, the cursor is placed over the first character of the block of text you want to MOVE or DELETE and then the <SFT>-<↑> keys are pressed. The action will be the same as if the INSERT Mode was entered and the text on that line will be shifted right one space and the MARKER will appear.

Move the cursor one character beyond the end of the block of text you wish to move or delete and again press the <SHIFT>-<↑> key. Now you have marked the beginning and end of the BLOCK. The text between the two MARKERS may now be moved or deleted. Exactly two markers must be used - otherwise, a MARKER ERROR message will appear on the video display when a move or delete is attempted.

<BREAK> is used when this error occurs to return to the text input mode so you may eliminate the extra markers or put in one you have forgotten. Markers may be deleted by using the SEARCH and REPLACE function or the DELETE CHARACTER function.

When you use the markers to delete a BLOCK of text, the markers themselves are automatically deleted along with the text.

**NOTE**

Markers should not be placed after an <ENTER> character on the screen. Instead, place the marker at the beginning of the following line. This will prevent the appearance of two markers on the screen.

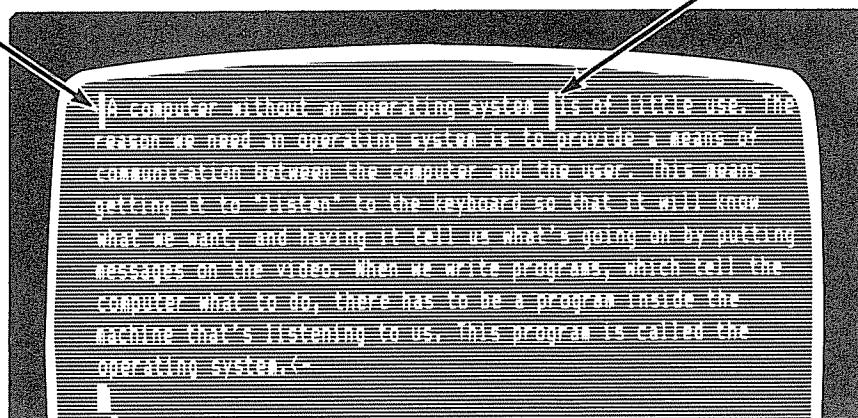
INSERT BLOCK      <CTL>-<H>

<CTL>-<H> is used to insert a correctly marked block at any selected cursor position and may be repeated as often as desired. "MARKER ERROR" will appear on the video display if an attempt is made to move a block into itself or if more or less than two markers exist in the file. See above for additional information on BLOCK MOVEMENT of text.

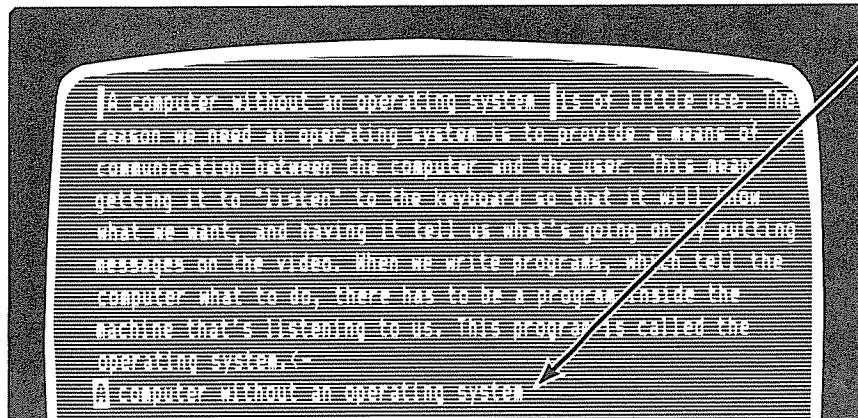
INSERT & DELETE BLOCK EXAMPLE

Move the cursor here and press **<SFT>-<A>**. The marker character will appear and move the text one place to the right.

Repeat the marking procedure here.



Now, move the cursor to here and press the **<CTL>-<H>** keys and the text will look like this.



Try pressing the **<CTL>-<H>** combination a number of times and see what happens. Move the cursor to the middle of the text and try it. Magic, huh?

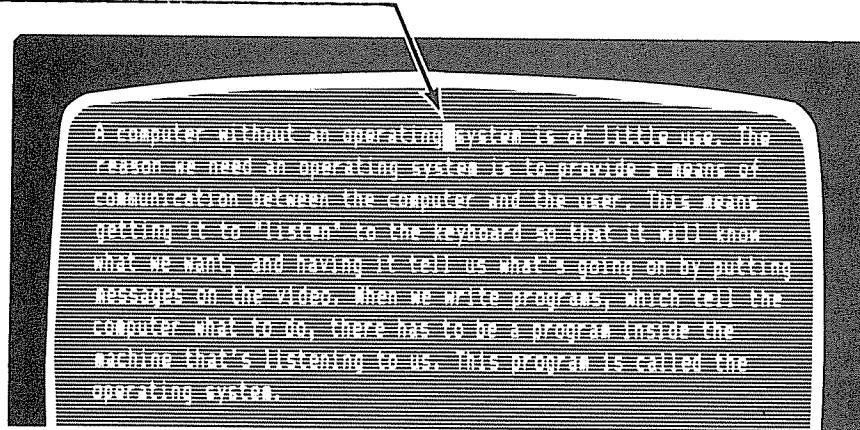
You may insert a block anywhere in the text EXCEPT within the MARKED block itself. You may make as many insertions as you need, or until you have filled up your memory. The **<CTL>-<R>** (repeat) function can also be used to repeat a block any number of times.

To delete the MARKED BLOCK press the **<CTL>-<U>** keys. The marked block AND the markers will disappear from the file.

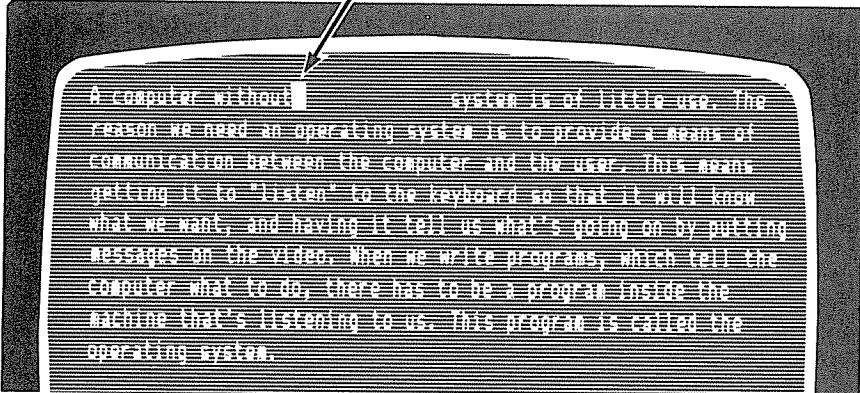
BACK SPACE & ERASE CHARACTER <SHIFT>-<↔>

This will cause the cursor to move from left to right and each character the cursor is moved over will be erased.

With the cursor here, pressing  
<SFT>-<↔> will ...



...backspace and erase.



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SPECIAL CHARACTER KEYS

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FORM FEED <SHIFT>-<▼>

A FORM FEED is used to terminate a paragraph or "record" and start a new page. When it is encountered during printing, the printer will advance the paper to the top of the next page. The FORM FEED character will appear as a down arrow character (↓) on the MODEL I and as a diamond character (◆) on the MODEL III.

TERMINATE A PARAGRAPH OR RECORD <ENTER>

<ENTER> is used to terminate a "record" or paragraph or to place an empty line between records. When <ENTER> is typed, a left-arrow will appear at the cursor position and the cursor will advance to the beginning of the next line.

NOTE: On some printers, such as the Centronics 779, you must precede a blank line with a space or the printer will ignore your blank lines.

UNDERLINE CHARACTER <CTL>-<Ø>

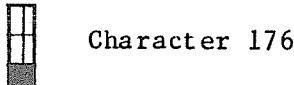
Since the TRS-80 does not have an underline character built into the keyboard, it is necessary to generate it by typing some special control code. <CTL>-<Ø> will generate the underline character just as if it had its own special key. Also see UNDERLINING below for a complete explanation of the use of underlines.

CONTROL KEY <CLEAR> or <CTL>

This key has no function of its own. It must be used with another key in order for it to have any special function. On modified MODEL I computers that have a special control key installed, BOTH the <CLEAR> key and the <CONTROL> key have exactly the same function; i.e. you may use either one if both are installed with exactly the same results.

HARD SPACE CHARACTER <CTL>-<SPACE>

The hard space is used to prevent the ELECTRIC PENCIL from adding spaces between words when printing justified text. The hard space character itself, does not print. On the video display it is handled as another input character and on the printer it is handled as a space character. On the video screen the hard space character is a graphics character that looks like this:



It is also useful for formatting text when you need to space words or characters on the video display in order to achieve a desired print format.

Here is an example of the use of the hard space. Suppose you had the print values set so that the line length was 50, and right justification was "on" (LL50, RJ1) and had a line of text that looked like this when it was printed out:

1. OPERATING SYSTEM - A group of programs

But, you preferred that it looked like this:

1. OPERATING SYSTEM - A group of programs

Then you would use the hard space to control the print formatting. Our line of text would look like this on the video display:

1. **OPERATING** SYSTEM - A group of programs

By using the hard space character, we can guarantee that the spacing in our title above will be just as it appears on the screen.

Another useful feature of the hard space is that it permits you to place a character on the video display that will not be printed (except as a space) and yet it will be "counted" as a character and not a space by the video. An example of this would be a word that is to be printed on the far right hand page of the paper - say in the seventieth column on your paper. The video display does not have seventy columns and The ELECTRIC PENCIL will not let you make seventy spaces as one solid line of SPACES. But, it will let you make a line of spaces AND characters seventy characters long. So, by using a combination of "hard spaces" and regular spaces, you can space over to the seventieth position on the screen and then type your text. It will then be printed on the far right side of the page.

CONCATENATE CHARACTER <CTL>-<→>

Concatenate is a fancy word meaning to "join together". This special graphics character will permit you to print lines that have spaces in them so that they are joined together. The concatenate character looks like this:



Character 179

The concatenate character and ALL spaces between it and the next character will be ignored. Here is an example of how a line to be concatenated might appear on the video display:



And here is how it will appear when it is printed:

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UTILITY FUNCTIONS

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**"STRING" SEARCH                    <CTL>-<V>**

In computer jargon, a "string" is any group of contiguous characters "strung" together ("contiguous" is a fancy word meaning adjacent or adjoining). The SEARCH function is used to locate any string of characters that may exist in the file from the current cursor position to the end of the file. <CTL>-<V> will place you into the SEARCH mode.

Suppose you wanted to search for a "string" of characters that looks like this:

yellow dogs

Simply type, <CTL>-<V>. The display will clear and then this message will be displayed:

SEARCH FOR:

Now type your search string into the computer so it looks like This:

SEARCH FOR: yellow dogs<ENTER>

Next the computer will ask you what you want to replace it with. Since we only want to FIND "yellow dogs" in our text and not replace it with anything, we will simply press the <ENTER> key like this:

REPLACE WITH: <ENTER>

If we had answered this question with an entry of one or more characters then pressed <ENTER>, it would have assumed that you wanted to SEARCH AND REPLACE "yellow dogs". The next question would have been:

HOW MANY TIMES:

If you simply press the <ENTER> key on the "REPLACE WITH?" question, it will assume that you only want to SEARCH for your string and not replace it and you will NOT be asked, "HOW MANY TIMES?". In this first example we'll assume that you only want to SEARCH for a string of characters.

The maximum "string" length that can be searched and replaced is 38 characters. In our SEARCH only example, the first occurrence of the string, from the cursor position forward, will appear as the top line on the video display with the cursor over the first character that matched the "search string".

The search may be continued by typing <CTL>-<C>. You may continue to press <CTL>-<C> until it can no longer be found. Each subsequent "find" will also appear as the top line, on the screen with the cursor over the first character of the "search string".

When the end of the file is reached or the string no longer exists in the file, this message will be displayed:

CAN NOT LOCATE "yellow dogs"

This function is used to quickly locate selected areas within a file.

The SEARCH function starts from the current cursor position. If the cursor is moved either forward or backwards in the file the search will proceed from that position.

SEARCH and REPLACE a STRING

This function is used to SEARCH for a string and REPLACE it with another string. The old and new strings may be of different lengths. Here is an example where we will replace "the" with "yellow dogs":

```
SEARCH FOR: the <ENTER>
REPLACE WITH: yellow dogs <ENTER>
HOW MANY TIMES: 12 <ENTER>
```

"12" represents the number of times that the replacement is to occur and may be ANY decimal number up to 65535. In the event that "the" only appears 8 times in the text (from the current cursor position), the screen will clear and display:

LOCATED "the" 8 TIMES

The actual replacement will have been made 8 times. If "the" occurs 12 or more times in the text, 12 replacements will be made and the cursor will return to the text file display. All occurrences of "the" can be replaced by typing a number greater than the possible occurrences of "the" to the HOW MANY TIMES question. For example:

```
SEARCH FOR: Mr. Jones <ENTER>
REPLACE WITH: Mr. Smith <ENTER>
HOW MANY TIMES: 55555
```

The system will respond with:

LOCATED "Mr. Jones" 14 TIMES

Assuming "Mr. Jones" appears only 14 times in the text.

CONTINUE SEARCH <CTL>-<C>

If a SEARCH is made without a REPLACE, you may continue the search after the first occurrence is found by pressing <CTL>-<C>. This may be repeated until the system can no longer find your search string.

CONDITIONAL SEARCH AND REPLACE <CTL>-<C>

If a SEARCH is made with a REPLACE but no value is entered in the HOW MANY TIMES question, the REPLACE function is "conditional". After the string is found, you have the option of pressing <CTL>-<C> and the "found string" will be replaced. Or you may move the cursor and THEN press <CTL>-<C> in which case the it will not be replaced and the next occurrence of the "search string" will be found.

"CODED" STRING SEARCHES <CTL>-<↔> "wild card" character

Strings may be also located where only a certain pattern is required. Suppose we had a file of names and addresses of clients with a "code" prefix that looks like this:

WS1234HP  
 Elron T. Quirt  
 99 W. Plotz Way  
 New York, N. Y. 10028

WP1235LP  
 Bill Smith  
 3800 Wilshire Blvd.  
 Los Angeles, CA. 90016

WS9541QM  
 Whelan J. Fixlip  
 1707 E. North West St.  
 Los Angeles, CA. 90028

WS6784HL  
 Elmer Brown  
 300 N. Vermont  
 Los Angeles, CA. 90028

SEARCH FOR: WS~~1234~~4H <ENTER>  
 REPLACE WITH: <ENTER>

will locate Elron T. Quirt. Typing <CTL>-<C> will then locate Elmer Brown. Note that " " is a "don't care" or "wild card" character. This character is generated by pressing the <CTL>-<↔> key combination. Using this function, a selected mailing list can be produced. Other uses might include lists of sales prospects with action dates to represent appointments, expirations, service dates, etc. Data can be selectively extracted from a file automatically using the coded string search function.

SEARCHING SPECIAL CHARACTERS

Special characters (such as the CARRIAGE RETURN (<↔>) and the FORM FEED (<↓>)) can be searched and/or replaced just like any other character. We cannot use the <ENTER> key to generate these characters in the SEARCH & REPLACE mode, because it would cause us to exit the mode. While in the SEARCH mode you may generate these characters as shown below:

<SFT>-<↔> will generate the <ENTER> character (<↔>).  
 <SFT>-<↓> will generate the FORM FEED character (<↓>).  
 <CTL>-<↔> will generate the "wild card" character ( " ).  
 <CTL>-<↔> will generate the "null" character ( " ).

SEARCHING AND REPLACING CHARACTERS WITH A "NULL"

Sometimes you may want to replace a string of characters or a character with a "null" or no character at all. If we had a sentence that looked like this:

Now is the time for all really good men to come to the aid of the party.

And we wanted it to look like this:

Now is the time for all good men to come to the aid of the party.

We will have to replace the word "really" with a "null" in order to get our sentence to look like the second example. Using the SEARCH AND REPLACE function we would answer the questions like this:

```
SEARCH FOR: really <ENTER>
REPLACE WITH: ¶ <ENTER>
HOW MANY TIMES: 1 <ENTER>
```

If the "null" character looks familiar, it is because it is the same character we used in the SEARCH FOR question for the "wild card" character - it serves a different purpose when it is used in the REPLACE WITH prompt.

REPEAT FUNCTION <CTL>-<R>, <n>, <n>, <key>

Most functions or key inputs may be repeated any number of times. The following examples will illustrate some typical uses of the REPEAT command.

```
<CTL>-<R>,<5>,<CTL>-<D> ..... will delete 5 characters.
<CTL>-<R>,<2>,<2>,<.> ..... will type 22 periods.
<CTL>-<R>,<3>,<CTL>-<H> ..... will insert a block of text 3 times.
```

The cursor will disappear whenever **<CTL>-<R>** is typed and will return after the number of repeats are performed. In the event of a typing error, the cursor will return and nothing else will happen. This three part command is not visible on the screen until you have completed the entire command key sequence.

Pressing **<BREAK>** will abort any phase of the REPEAT FUNCTION.

SYSTEM MENU                            <CTL>-<K>

Pressing the <CTL>-<K> keys will cause the program to exit the TEXT ENTRY mode and enter the SYSTEM MENU mode. Press <BREAK> to exit the SYSTEM MENU mode and return to the TEXT ENTRY mode.

PRINT TEXT ON LINE PRINTER <CTL>-<P>

This command will cause the PRINT MENU to be displayed. (See PRINT MENU COMMANDS below.) Printing will be initiated from the PRINT MENU from the current cursor position to the end of the file on the line printer.

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**SPECIAL PURPOSE FUNCTIONS**

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**ABORT CURRENT FUNCTION <BREAK>**

You may abort ANY function or return from ANY menu by pressing the <BREAK> key.

**UPPER/LOWER CASE LOCK <SHIFT>-<@> or <SHIFT>-<BREAK>**

If your computer has the upper/lower case modification you may "lock" the keyboard into upper case mode with this command. (It corresponds to the SHIFT-LOCK key on a typewriter.) Pressing the key combination again will "unlock" it and upper case will then be entered by pressing the <SHIFT> key and the letter key.

**DICT-A-MATIC (CASSETTE ON/OFF) <SHIFT>-<ENTER>**

One of the most valuable functions of a word processor is being able to transcribe a recording such as the minutes of a meeting, letters, and other dictated texts. THE ELECTRIC PENCIL has a built-in cassette stop-start command. By pressing <SHIFT>-<ENTER> the cassette recorder is turned on. When <SHIFT>-<ENTER> is pressed again, it is turned off. This permits you to control the dictation play back with the computer keyboard.

Attach the cassette to the cassette port and plug the AUX and MIC plugs into the cassette recorder. Do not plug in the EAR plug (the black plug). Now, insert the tape cartridge into the player and depress the PLAY button. Set the volume control and press <SHIFT>-<ENTER> and the cassette player will begin operating. Press <SHIFT>-<ENTER> again and it will stop.

The REWIND, FAST FORWARD and PLAY buttons, on the recorder, all function normally so you may fast forward and rewind without having to remove any plugs.

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**RESERVED FUNCTIONS**

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The following control codes are not used by this release of THE ELECTRIC PENCIL but may be used by future releases or program modules that will provide added features for THE ELECTRIC PENCIL.

```
<CTL>-<A>, <CTL>-<W>, <CTL>-<S>, <CTL>-<Z>, <CTL>-<L>,
<CTL>-<J>, <CTL>-<0>, <CTL>-<M>, <CTL>-<+>, <CTL>-<,>,
<CTL>-<.>, <CTL>-</>, <CTL>-<:>, <CTL>-<->, <CTL>-<1>,
<CTL>-<2>, <CTL>-<3>, <CTL>-<4>, <CTL>-<5>, <CTL>-<6>,
<CTL>-<7>, <CTL>-<8>, <CTL>-<9>, <CTL>-<@>, <CTL>-<BRK>,
<CTL>-<BRK>, <CTL>-<SFT>
```

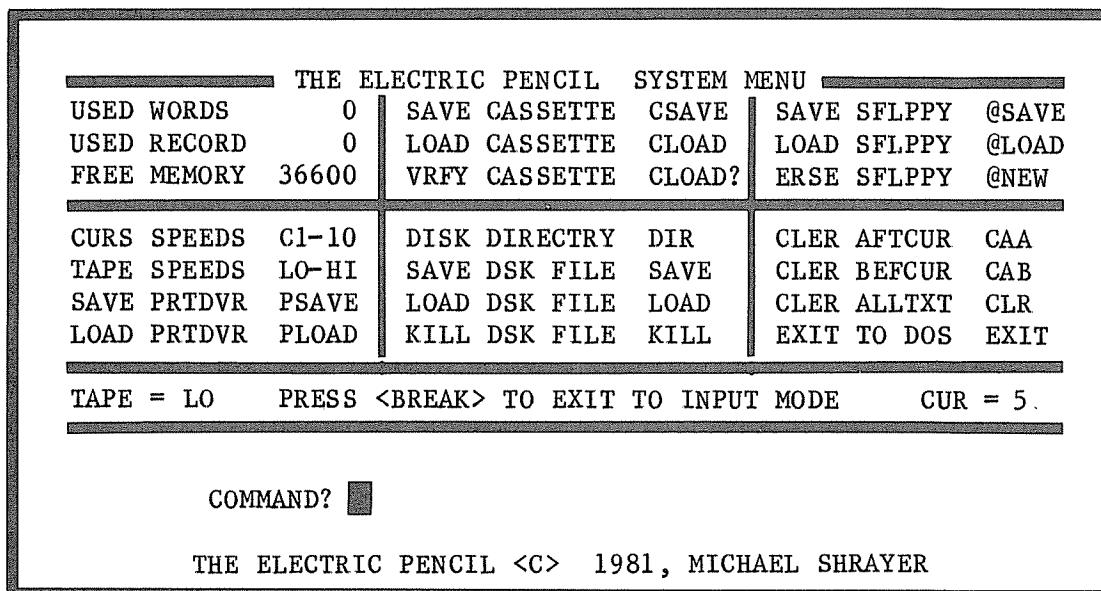
=====

SYSTEM MENU COMMANDS

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Within THE ELECTRIC PENCIL, is a SYSTEM MENU that permits you to enter additional commands that are related to THE ELECTRIC PENCIL/TRS-80 hardware/software system as a whole.

To enter the SYSTEM MENU type <CTL>-<K> and the text display will be replaced with the SYSTEM MENU as shown in the figure below.

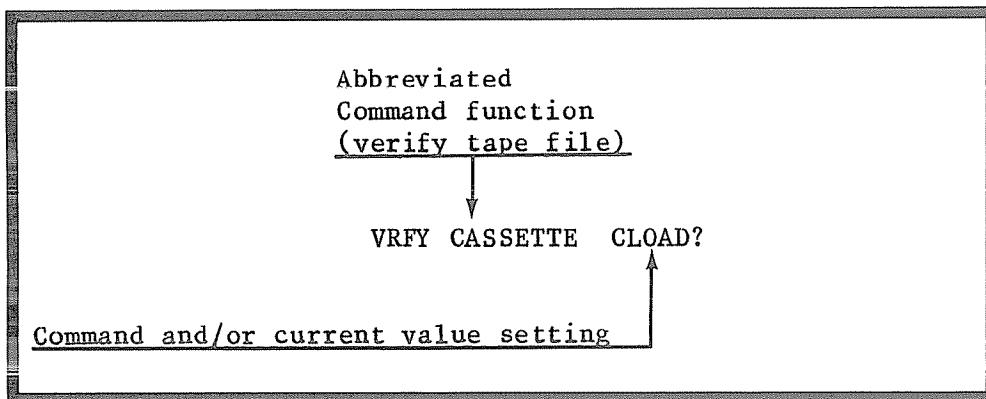


While in the SYSTEM MENU, the standard keys are used without the CONTROL key. The SYSTEM MENU commands are NOT Control Character Commands. All commands must be terminated with <ENTER>. The LEFT-ARROW key (←) is used to backspace and the <BREAK> key is used to exit the SYSTEM MENU.

In the upper two-thirds of the SYSTEM MENU is a list of the command functions and their corresponding command statements. In the lower third is the command line itself and a solid non-flashing cursor. To enter a command, type the command and any additional parameters, such as file names or number values and press <ENTER>. If you enter an invalid command, an error message will be displayed and you may re-type the command. If the system detects an error, during an operation, an error message will also be displayed. If you use the correct command but specify a parameter incorrectly the message: SYNTAX ERROR will be displayed. So much for what can go wrong - let's talk about what can go right!

Because of the number of commands that need to be displayed, we have had to abbreviate the command functions. First we will review the menu format then the command functions and their abbreviations. Following that is a detailed discussion of each function and command.

SYSTEM MENU format:



The SYSTEM MENU commands are divided into three groups:

FUNCTION	ABBREVIATION	COMMAND	PAGE
<b>UTILITY FUNCTIONS:</b>			
Number of words in file . . . . .	USED WORDS	0 . . . 48	
Number of records in file . . . . .	USED RECORD	0 . . . 48	
Amount of free memory . . . . .	FREE MEMORY	36600 . . . 48	
<b>SPECIAL UTILITY COMMANDS (NOT DISPLAYED IN MENU):</b>			
Save program configuration . . . . .	SETUP	49	
Do not save print values . . . . .	PVOFF	49	
Save print values . . . . .	PVON	50	
<b>SYSTEM COMMANDS:</b>			
Set cursor speed . . . . .	CURS SPEEDS	C1-10 . . . 50	
Set tape speed (baud) . . . . .	TAPE SPEEDS	LO-HI . . . 50	
Save print driver . . . . .	SAVE PRTDVR	PSAVE . . . 51	
Load print driver . . . . .	LOAD PRTDVR	PLOAD . . . 52	
Clear all text after cursor . . . . .	CLER AFTCUR	CAA . . . . . 53	
Clear all text before cursor . . . . .	CLER BEFCUR	CAB . . . . . 53	
Clear all text from memory . . . . .	CLER ALLTXT	CLR . . . . . 53	
Return to DOS READY . . . . .	EXIT TO DOS	EXIT . . . . . 53	
<b>FILE COMMANDS:</b>			
Save file to tape cassette . . . . .	SAVE CASSETTE	CSAVE . . . 55	
Load file from tape cassette . . . . .	LOAD CASSETTE	CLOAD . . . 56	
Verify file on tape cassette . . . . .	VRFY CASSETTE	CLOAD? . . . 57	
Save file to Stringy Floppy . . . . .	SAVE SFLPPY	@SAVE . . . 58	
Load file from Stringy Floppy . . . . .	LOAD SFLPPY	@LOAD . . . 59	
Erase file from Stringy Floppy . . . . .	ERSE SFLPPY	@NEW . . . 60	
Display diskette's directory . . . . .	DISK DIRECTRY	DIR . . . . . 62	
Save file on diskette . . . . .	SAVE DSK FILE	SAVE . . . . . 63	
Load file from diskette . . . . .	LOAD DSK FILE	LOAD . . . . . 65	
Kill file on diskette . . . . .	KILL DSK FILE	KILL . . . . . 66	

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SYSTEM MENU UTILITY FUNCTIONS

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NUMBER OF WORDS IN TEXT FILE

Each time you enter the SYSTEM MENU, THE ELECTRIC PENCIL calculates the number of WORDS you have entered into your text file from the cursor's present position in the file to the end of the file and displays it opposite "USED WORDS"

A "WORD" is any character or group of characters with a space or <ENTER> (←) character at either end. A "word" may be as short as one character and as long as one line. For instance, each of the following examples would count as one word:

N←  
Now←  
Now ←  
Now is the time for all good men←  
=====←

Notice that there are three examples that begin with the word, "Now". In the first example the carriage return character immediately follows the "w" in "Now". In the next example there is a space between the "w" and the "←" symbol but it is still counted as one word. In the next line there are a bunch of English words that have been run together. Of course you and I can read them but the computer cannot, so it counts the whole thing as one "word". The string of equal signs (=) will also be counted as one "word".

NUMBER OF RECORDS IN TEXT FILE

Each time you enter the SYSTEM MENU, THE ELECTRIC PENCIL calculates the number of RECORDS you have entered into your text file from the cursor's present position to the end of the file and displays it opposite "USED RECORD"

A "RECORD" is any block of text that is terminated by <ENTER> (←) or the FORM FEED (↓ = MODEL I ♦ = MODEL III) character. A record may be as short as one character and as long as an entire text file

FREE MEMORY

The amount of memory you have left, in which you may enter your text file, is automatically displayed in the SYSTEM MENU opposite "FREE MEMORY".

Each BYTE of memory may contain one character. Most text files average a word length of five characters per word. If you had 25000 bytes of memory remaining you would be able to enter approximately 5000 words in your text file. If you are writing a medical article and use words like, "phenomenultramicroscopic-volcanosilicosis" your text will not average five letters per word. Although your word count will be less, you still have the same amount of memory as someone who uses shorter words.

=====

SYSTEM COMMANDS

=====

CONFIGURE THE ELECTRIC PENCIL SETUP (disk systems only)

Each person likes to have his or her own special default print values, cassette baud rate and cursor speed. With the SETUP command, you can set-up THE ELECTRIC PENCIL's print values, tape baud rate and cursor speed to suit your own personal tastes.

To set your own default conditions, load THE ELECTRIC PENCIL and then set the CURSOR SPEED and TAPE BAUD rate from the SYSTEM MENU. Then, go to the PRINT MENU and set all of the values to suit your own needs. All of the values displayed in the PRINT MENU including the active print driver may be set.

Now, return to the the SYSTEM MENU and type:

COMMAND? SETUP:n <ENTER>

where 'n' is a drive number specification between 0 and 3. A "set-up" file will be created on the specified drive. The name of this file will be, "PENCIL04/SYS". You may create or change this file at any time. You may also KILL it and the original ELECTRIC PENCIL default values will be used. If the drive specification is not used, the SETUP file will be saved to the first available diskette space.

If you have created a custom print driver and have saved it with the PSAVE command and have it loaded at the TIME you issue the SETUP command, it will also be loaded and initialized when you type PENCIL<ENTER>, just as if it were part of THE ELECTRIC PENCIL program. (Also see PSAVE, PDRIVE, and USING A CUSTOM PRINT DRIVER.)

NOTE: The SETUP command is not displayed in the SYSTEM MENU.

TURN OFF THE "SAVE PRINT VALUES" FEATURE PVOFF

To turn-off the save print values feature, from the SYSTEM MENU type:

COMMAND? PVOFF <ENTER>

Tape, Stringy Floppy and disk files made with previous versions of THE ELECTRIC PENCIL are compatible with this release. However, tape and Stringy Floppy files created with this release are NOT compatible with previous releases when the PRINT VALUES have been saved with the file. If you wish to create files that will be used on a previous release of THE ELECTRIC PENCIL, then turn off the SAVE PRINT VALUES feature with the PVOFF command.

Also, when you are creating CHAIN files or JCL files for use under one of the various disk operating systems, such as NEWDOS/80 or LDOS, it is advisable to save those files with out the print values being saved with the file.

NOTE: The PVOFF command is not displayed in the SYSTEM MENU.  
PVON (see below) is the default condition.

TURN ON THE "SAVE PRINT VALUES" FEATURE PVON

To turn-on the save print values feature, from the SYSTEM MENU type:

COMMAND? PVON <ENTER>

NOTE: The PVON command is not displayed in the SYSTEM MENU.  
PVON is the default condition.

SET CURSOR SPEED "C1-10"

If the cursor seems to move too slowly, try this command using any number between "0" and "10". Speed "0" is the slowest and speed "10" is the fastest. With a little experimentation, you will determine the cursor speed that you are most comfortable with.

The current cursor speed is displayed in the menu's status line as: CUR = 5. When you set the cursor speed this will be updated to reflect the current setting.

With a lower cursor speed, the "debounce" capability of the keyboard routine is improved. Severe keyboard bounce can usually be cured with a speed setting of 1 or 2.

SET CASSETTE BAUD RATE "LO-HI"

This command is valid only on the MODEL III machine. The MODEL I machine will ignore this command. Entering the "LO" command will set the tape cassette speed to 500 baud. Entering the "HI" command will set the tape cassette speed to 1500 baud. The "LO" command will permit the reading of tapes made on the MODEL I machine to be read on the MODEL III. Conversely, tapes made using the "LO" setting on the MODEL III may be read on the MODEL I.

The default value, for the MODEL III machine is "HI" and of course the MODEL I machine will only display the "LO" setting.

SAVE A PRINT DRIVER AS A "LOAD MODULE" "PSAVE filespec:n"

Once you have loaded and initialized a custom print driver, you may "SAVE" that driver as a "load module". (See "USING A SPECIAL PRINT DRIVER" Appendix II.) This means that when you use this driver in the future you will no longer have to set memory, load the DCB with the driver address, and initialize it. All of these things will be done automatically. In fact, the print driver "load module" can be used WITHOUT THE ELECTRIC PENCIL!

Suppose you have a special print driver for a Selectric typewriter that has been converted to a computer printer. For the sake of our example, let's say that you have named your print driver, "SELECDRV/CMD". Let's also suppose you have followed the instructions in "USING A SPECIAL PRINT DRIVER" in Appendix II. Now, your print driver is loaded, high memory has been set and the DCB initialized and you have THE ELECTRIC PENCIL running and want to make a "load module" out of "SELECDRV/CMD" so that you don't have to go through all this rig-a-marole every time you want to use "SELECDRV/CMD" with PENCIL. For reasons known only to you, you want to save the load module to a diskette on drive one.

Go to the SYSTEM MENU by pressing <CTL>-<K>. Type the following:

```
PSAVE SELECDRV/CMD:1<ENTER>
```

This will save the print driver as a load module on drive one. If you wanted to save it to drive zero then you could use one of the two following methods:

```
PSAVE SELECDRV/CMD:@<ENTER>
PSAVE SELECDRV<ENTER>
```

In the second example above, we did not specify the drive or the filename extension, "/CMD". THE ELECTRIC PENCIL will append the "/CMD" file name extension automatically. It will also save the "load module" to the first available diskette, drive zero in this case, if it has free space and is not write protected.

A PSAVE using the same name as an existing print driver will cause the existing print driver to be overwritten.

Also see Appendix II for more details on how to use a custom print driver.

LOAD A PRINT DRIVER "LOAD MODULE" "PLOAD filespec:n"

This command will load a print driver created with the "PSAVE" command. (See "USING A SPECIAL PRINT DRIVER", Appendix II.) A print driver may be loaded at any time. Using the example above, let's "load" a print driver we have already created. The name of our "example print driver" is, "SELECDRV/CMD" and we have it stored on a diskette in drive one. Go to the SYSTEM MENU with the <CTL>-<K> command and type any one of the below examples:

```
PLOAD SELECDRV:1<ENTER>
PLOAD SELECDRV/CMD:1<ENTER>
PLOAD SELECDRV<ENTER>
PLOAD SELECDRV/CMD<ENTER>
```

All of the above examples will work. If there is another print driver on drive zero WITH THE SAME NAME, then the third and fourth examples will load from drive zero and not drive one since you did not specify the drive that the print driver will be loaded from.

A PLOAD operation can only be performed when there is no text file in memory. This is because the PLOAD command will cause the available memory to be adjusted to a smaller value that may interfere with your text file. Any attempt to PLOAD a print driver with a text file in memory will result in the following message:

PRINT DRIVER CANNOT BE LOADED WITH TEXT IN FILE SAVE & CLR FIRST

To PLOAD a print driver when you have a text file in memory first, save the file. Second, clear the file from memory with the CLR or CAA command. Third, PLOAD your print driver. Now, reload your original file.

CLEAR ALL TEXT AFTER CURSOR "CAA"

"CAA" will clear all text in the file, from the current cursor position to the end of the file. When the text has been cleared, you will automatically exit from the SYSTEM MENU and may resume entering text.

The clearing commands require three characters to be entered by the user as a precaution against accidental clearing of the file area and wiping-out your text file. These commands should be used with caution since any material in the file area cannot be retrieved once it has been erased from memory. Back-up copies of text should always be made of files before text is cleared.

The PRINT VALUES are not affected by this command.

CLEAR ALL TEXT BEFORE CURSOR "CAB"

"CAB" will clear all text in the file, from the current cursor position to the beginning of the file. The character under the cursor will not be cleared. When the text has been cleared, you will automatically exit from the SYSTEM MENU and may resume entering text.

The PRINT VALUES are not affected by this command.

CLEAR ALL TEXT FROM THE SYSTEM "CLR"

"CLR" will clear the entire text file area no matter where the cursor is positioned in the file. The video display will clear and you will return to the text input mode.

The PRINT VALUES are not affected by this command.

NOTE: "CLR", "CAA" and "CAB" should be used with care.

EXIT THE ELECTRIC PENCIL TO DOS "EXIT"

To exit THE ELECTRIC PENCIL program to the "DOS READY" mode, enter the SYSTEM MENU and type: EXIT<ENTER>. When the command executes, the screen will clear and you will see the "DOS READY" message. It is possible on disk systems to re-enter THE ELECTRIC PENCIL by using the RESTART COMMAND (PENCIL \*) unless you have executed another program that has overwritten the text buffer.

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SYSTEM MENU FILE COMMANDS

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CAUTION  
SPECIAL NOTE ON ALL TAPE, STRINGY FLOPPY AND DISK  
OPERATIONS

On previous releases of THE ELECTRIC PENCIL, the text buffer was cleared after a bad load, thereby eliminating any chance of recovering or partially recovering an important file that was recorded on media that had become damaged or had developed a parity error. With this release, any portion of a text file that loaded successfully, is left in the buffer with whatever errors it may have contained up to the point that it failed to load. INSPECT THE TEXT FILE BEFORE PROCEEDING! The clearing of the text buffer is YOUR option, not that of the program.

NOTE: Also see SET TAPE SPEEDS above.

LOADING MORE THAN ONE FILE AT A TIME

You may concatenate (a fancy word meaning to join or link together) tape, Stringy Floppy and disk files in memory. Simply load each file until you have loaded all of the files needed for your final document. If an entire file will not fit into memory you will receive the message:

FILE AREA FULL

CAUTION: Partially loaded files ARE NOT CLEARED FROM MEMORY! Inspect your file as you may wish to clear the partially loaded file with the CAA command.

Using this feature is an excellent way to build form letters, contracts, legal forms, technical manuals or any other document that requires the use of "standard" paragraphs or sections that you have saved as separate text files.

LOAD A TEXT FILE FROM TAPE "CLOAD"

Entering the "CLOAD" command causes the cassette tape deck to be activated and a text file that is stored on tape, to be loaded into memory.

To LOAD a text file that is on cassette tape into the file area of THE ELECTRIC PENCIL, first position the tape to a few inches before the start of the file, then enter the tape read command CLOAD and press <ENTER>. (Don't forget to set the volume control before starting the load.) The cursor will disappear from the screen. The computer is waiting for input from the tape. Now press the cassette recorder's "PLAY" button and the program will begin reading your text file into memory.

When the file has been correctly read into memory, "TAPE FILE LOADED" will appear on the screen. If there has been an error in the reading of the tape, the message "TAPE ERROR" will appear.

When a file is read into THE ELECTRIC PENCIL, it is placed at the end of any text file that may already exist in the file area. If this is to be a new file, the file area should be cleared (See "CLR", "CAA" and "CAB"). If the incoming file is too long for the existing memory, "FILE AREA FULL" will appear on the screen.

**CAUTION:** Partially loaded files ARE NOT CLEARED FROM MEMORY! Inspect your file as you may wish to clear the partially loaded file with the CAA command.

**EXAMPLE:**

CLOAD<ENTER> - Read tape file into memory at the current baud rate.

Pressing the <BREAK> key during a CLOAD operation will terminate the load. That part of the file, which has been successfully loaded will remain in memory.

**WRITE A TEXT FILE TO TAPE "CSAVE"**

Entering the "CSAVE" command causes the cassette tape deck to be activated and a text file that is in memory to be recorded (stored) on cassette tape.

To write a file onto cassette tape, first place the cursor to the position in the file FROM which you wish to write. If the entire file is needed, then <CTL>-<B> should be used to place the cursor at the beginning of file. <CTL>-<K> will then bring up the SYSTEM MENU.

Place the cassette recorder in RECORD MODE at a convenient location on the tape. Enter the "CSAVE" command and press <ENTER>. The cursor will disappear and writing will begin. When the file has been recorded onto the tape, "WRITTEN" will appear on the screen.

EXAMPLE:

CSAVE<ENTER> - Write tape file onto cassette tape at the current baud rate.

**NOTE**

After you have written your text file to the tape, it is recommended that you VERIFY the tape before proceeding further. See VERIFY below.

When working with a long text, it is advisable to periodically write the file onto tape as a precaution against power failures which can destroy all material in the file area as well as THE ELECTRIC PENCIL program as it is stored in memory.

Pressing the <BREAK> key during a CSAVE operation will terminate the save.

A file partially saved to tape may be reloaded into the file area with the CLOAD command. However, THE ELECTRIC PENCIL will report a TAPE ERROR when it encounters the end of the file since it was not fully saved.

That part of the file which has been successfully loaded will remain in memory.

**VERIFY TAPE WRITE "CLOAD?"**

"CLOAD?" is basically the same as "CLOAD" except the file is not placed into the file area. It is, however, checked for correctness. When a tape file has been verified, the message, "TAPE FILE VERIFIED" will be displayed if the tape is correct or with "TAPE ERROR" if it is not. A tape just written showing "TAPE ERROR" should be re-written with the "CLOAD" command. Continual tape errors indicate faulty tape or a faulty cassette recorder.

After writing a file to the tape, be sure to rewind it before executing the CLOAD? command and then set up the cassette tape recorder as if you were going to LOAD a file.

EXAMPLE:

CLOAD?<ENTER> - Verify tape file with memory file.

Pressing the <BREAK> key during a CLOAD? operation will terminate the CLOAD? (verify) operation.

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 STRINGY FLOPPY FILE COMMANDS
 

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NOTE: On all Stringy Floppy file operations:

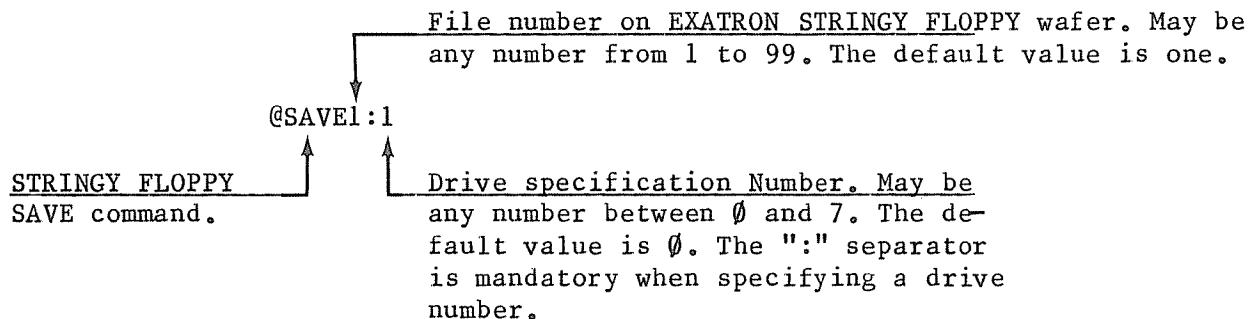
Pressing the <BREAK> key during ANY Stringy Floppy file operation will abort the operation and the message, "BREAK" will be displayed.

On disk systems, an Electric Pencil system overlay will be loaded from disk each time you ISSUE a Stringy Floppy file command.

All Stringy Floppy error messages are generated by the Stringy Floppy's own software. Consult your Exatron Stringy Floppy operating manual for the meaning of these error messages.

SAVE TEXT TO STRINGY FLOPPY WAFER @SAVE:n

@SAVE1:1 will cause the text in memory from the current cursor position to the end of file to be written to the EXATRON STRINGY FLOPPY wafer on drive number one as file number one. The format of the SAVE command is as follows:



The file specification and drive specification are optional. If they are not specified, then the default values are used. The file number default is "1" and the drive default is "0".

The SAVE command automatically performs an @NEW function on the entire wafer AFTER file #1! This prevents the writing of a file that is longer than the available space on the EXATRON STRINGY FLOPPY wafer.

CAUTION: Because of the way in which the Stringy Floppy handles its SAVEs it is NOT recommended practice to put multiple files on Stringy Floppy wafers

If there is not room on the current wafer to write the text file you will get the message:

TAPE TOO SHORT ERROR

CAUTION: Because the files are ERASED before they are SAVED, make sure you have a spare wafer ready in the event that you have a valuable text file that must be saved to the EXATRON STRINGY FLOPPY wafer.

Important files should be on their own Stringy Floppy wafer. In this way you will always be sure to have room for the file.

READ STRINGY FLOPPY WAFFER @LOADn:n

@LOAD1:1 will cause the EXATRON STRINGY FLOPPY, drive number one, to load text file number one on the wafer that is currently in drive one. The format of the LOAD command is as follows:

File number on EXATRON STRINGY FLOPPY wafer. May be  
any number from 1 to 99. The default value is one.

@LOAD1:1

STRINGY FLOPPY  
LOAD command.

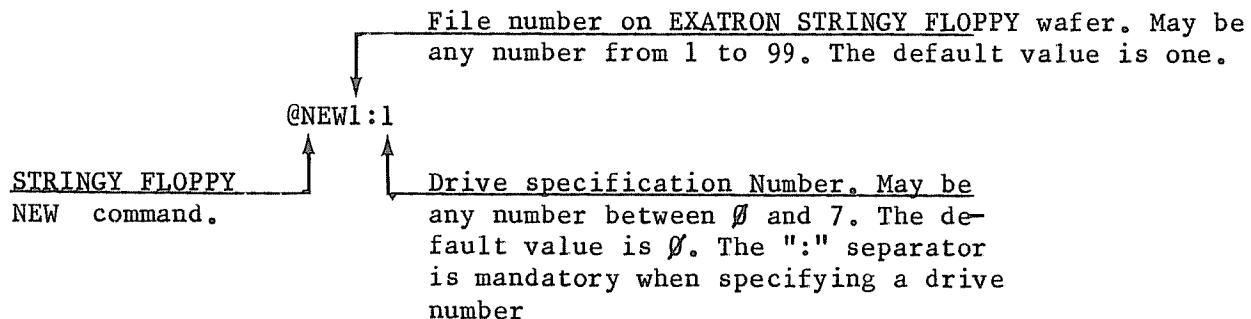
Drive specification Number. May be  
any number between 0 and 7. The de-  
fault value is 0. The ":" separator  
is mandatory when specifying a drive  
number.

```
graph TD; LOAD["@LOAD1:1"] --> STRINGY["STRINGY FLOPPY<br/>LOAD command."]; STRINGY --> FILE["File number on EXATRON STRINGY FLOPPY wafer. May be<br/>any number from 1 to 99. The default value is one."]; STRINGY --> DRIVE["Drive specification Number. May be<br/>any number between 0 and 7. The de-<br/>fault value is 0. The ":" separator<br/>is mandatory when specifying a drive<br/>number."]
```

The file specification and drive specification are optional. If they are not specified, then the default values are used. The file number default is "1" and the drive default is "0".

ERASE STRINGY FLOPPY WAFFER @NEWn:n

@NEW1:1 will cause file number one, in the EXATRON STRINGY FLOPPY drive number one, to be erased. @NEW:1 will cause ALL files to be erased on the EXATRON STRINGY FLOPPY wafer in drive one! The format of the NEW command is as follows:



The file specification and drive specification are optional. If they are not specified, then the default values are used. The file number default is "1" and the drive default is "0".

CAUTION: Use this command carefully as you may unintentionally erase all files.

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**DISK COMMANDS**

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**SPECIAL NOTE ON DISK FILE OPERATIONS**

All the disk files are LOADED and SAVED with the file extension "/PCL". This is how THE ELECTRIC PENCIL is able to recognize files that it has made as its own. It also has the advantage of filtering out files which are NOT ELECTRIC PENCIL files when you ask for a DIRECTORY listing from THE ELECTRIC PENCIL's SYSTEM MENU. You may also LOAD and SAVE files that have any other file extension. See DIR, LOAD, SAVE and KILL below.

All the TRS-DOS rules apply to drive, file specifications, and passwords. Consult your DOS manual for particulars concerning disk operations, file specifications and disk drive numbering specifications.

DISPLAY DISK DIRECTORY      DIR :n

The "DIR" command will obtain a DIRECTORY of The ELECTRIC PENCIL files with the file extension "/PCL" only, on any disk drive. Enter the SYSTEM MENU with the <CTL>-<K> command. Now type "DIR" and press <ENTER>. The screen will clear and any ELECTRIC PENCIL files that exist on DRIVE 0 will be displayed. If there are no PENCIL files, then the screen will remain blank.

By placing a number after "DIR", like this: "DIR1", we will get a listing of the PENCIL files on DRIVE ONE.

'n' may be any number between 0 and 3. If no number is appended to the "DIR" command, the default drive will be drive zero.

EXAMPLE:

DIR0<ENTER>	- Display directory of Pencil files on drive zero.
DIR<ENTER>	- Display directory of Pencil files on drive zero.
DIR1<ENTER>	- Display directory of Pencil files on drive one.
DIR2<ENTER>	- Display directory of Pencil files on drive two.
DIR3<ENTER>	- Display directory of Pencil files on drive three.
DIR :3<ENTER>	- Display directory of Pencil files on drive three. the space and colon are optional on the "DIR" command.

To obtain a directory listing of ALL files, regardless of the file extension, precede the drive specification with an asterisk.

EXAMPLE:

DIR*0<ENTER>	- Display directory of ALL files on drive zero.
DIR*<ENTER>	- Display directory of ALL files on drive zero.
DIR*1<ENTER>	- Display directory of ALL files on drive one.
DIR*2<ENTER>	- Display directory of ALL files on drive two.
DIR*3<ENTER>	- Display directory of ALL files on drive three.
DIR :*3<ENTER>	- Display directory of ALL files on drive three. the space and colon are optional on the "DIR" command.

SAVE TEXT to DISK FILE      SAVE filespec/ext:n

SAVE is the reverse function of LOAD (see below). SAVE will cause the text file to be written to a disk file FROM the current cursor position in the file to the end of the file. If a file name extension is not specified, then the extension "/PCL" will be added to the filename. The same file specifications apply to SAVE as apply to LOAD.

EXAMPLE:

- SAVE EXAMPLE<ENTER> - Saves a file on the first available drive with the file name: "EXAMPLE/PCL".
- SAVE EXAMPLE:2<ENTER> - Saves a file on drive two with the file name: "EXAMPLE/PCL".
- SAVE EXAMPLE.MIKE:2<ENTER> - Saves a file on drive two with the file name: "EXAMPLE/PCL" and the password: "MIKE"
- SAVE EXAMPLE/:2<ENTER> - Saves a file on drive two with the file name: "EXAMPLE".
- SAVE EXAMPLE/TXT:2<ENTER> - Saves a file on drive two with the file name: "EXAMPLE/TXT".

NOTE: The colon (:) is mandatory when entering a drive specification.

If you want to SAVE a file with an extension other than "/PCL" then the file must be saved and loaded with your file name extension. To SAVE a file without an extension, enter the slash (/) at the end of the file name without an extension. Also see "DIR \*" above to display file names with extensions other than "/PCL".

It is possible to "lose" a disk file with the SAVE command. You don't actually lose the file, but cause it to be overwritten with the last few bytes at the end of the file in the text buffer. It is not the program's or the machine's fault, it is yours and here is how it happens. (The following is excerpted from: "TRS-80 Disk & Other Mysteries" by H.C. Pennington. - reprinted by permission)

There are two reasons for this unfortunate circumstance:

**UNFORTUNATE REASON #1:** You were working on this file only a couple of days ago. Everything was working smoothly and when you were through entering your text, you saved the file to the disk. You removed the disks from the drives, shut everything down and went home (or to another room) and watched an exciting rerun of "I Love Lucy" before dinner.

Several days (or hours) later you went back to the computer to use that file. You bring up THE ELECTRIC PENCIL program and load the file. What??!! It's GONE! There are only three carriage returns on the screen! After the blood returns to your brain and you finally begin to believe your eyes, reason returns to your fogged brain; you decide you must have saved it on another disk.

Forty-seven disks later you give up and say to yourself, "...damnit, I KNOW I saved that file. I wonder what could have happened to it? It must have been eaten-up by the machine or something." Thus, you conclude that there are mysteries that are beyond human understanding and consult the TV Guide to see what time Mork & Mindy come on.

The truth of the matter is that nobody ate nothin'. Everything worked exactly like it was supposed to, you screwed up. In your dazed and confused state, after typing for six hours, you "SAVE'd your file WITH THE CURSOR AT THE END INSTEAD OF AT THE BEGINNING OF THE FILE!

UNFORTUNATE REASON #2: You accidentally "KILL"ed the file by using the wrong file name. I don't know why you did it but it sometimes does happen. (By permission from the author.)

There is not room here to quote the recovery techniques, but you may obtain a copy of "TRS-80 Disk & Other Mysteries" and learn them with very little effort.

There is one other common problem with the SAVE command. When the cursor is at the absolute end of the file and there are no characters of any kind, including carriage returns, if you attempt to SAVE the file, you will get the message:

NO FILE

It simply means that there is no text file BEYOND THE CURRENT CURSOR POSITION. Return to the text buffer and with the <BREAK> function, shift the cursor to the beginning of the text and then SAVE the file.

A SAVE when the cursor is not positioned at the very beginning of the file, will cause this message to be printed in the "copyright" line of the SYSTEM MENU:

WARNING: CURSOR NOT AT BEGINNING OF FILE ONLY PART OF FILE SAVED

Hopefully, this message will help you to avoid the circumstances that caused UNFORTUNATE REASON #1, above.

LOAD TEXT FROM DISKLOAD filespec/ext:n

To LOAD a text file from a diskette you must enter the LOAD command and the file specification. The drive number is optional. If a file name extension is not specified, then the extension "/PCL" will be added to the filename.

For instance, suppose we have a three drive system and two identical files on drives one and two. Our "system" disk is in drive zero. The name of our example file will be "EXAMPLE/PCL". Of course we will only see the file name "EXAMPLE" when we do a directory from PENCIL'S SYSTEM MENU unless we use DIR's asterisk option (see above).

Now the reason we have saved the same identical file on two separate diskettes is because we have made some changes to one of the files but not the other. Because we stayed up too late last night, watching the late-late-late movie on channel five, we saved the text to another diskette and forgot to give it a different name. Now, we have to load the file, but which one?

There are two things we can do. We could put one of the diskettes in drive one and load the file. If it was the wrong one, clear the text buffer with the "CAA" command, remove the first disk and insert the second one, then repeat the process.

The second thing we could do is put the first diskette in drive one and the second diskette in drive two. Now we will load the file from the diskette on drive one like this:

```
LOAD EXAMPLE:1<ENTER> or like this:  
LOAD EXAMPLE<ENTER>
```

NOTE: The colon (:) is MANDATORY when specifying the drive specification.

Remember that the DOS will load the file from the first diskette that it finds that file name on - if we use the second of the two above examples. Since the first place that it will find it is drive one, we don't REALLY need to specify that drive.

Now we will inspect the file that we have loaded. DAMN! It's the wrong one. Well, Murphy wins again. Now we will clear the buffer with the "CAA" or "CLR" command, and load the file from the diskette on drive two like this:

```
LOAD EXAMPLE:2<ENTER>
```

The system will ONLY look on drive two. If it does not find the file there it will not look on any other drive. In this case we have inserted a diskette on drive two with the "EXAMPLE/PCL" file on it, so it will find it and load it.

If you have a file in the text buffer and load a file from the disk and do not clear the text buffer, the file will load at the END of the text file in memory. This is especially useful when writing "form" letters where you have various "standard" openings, paragraphs and closings.

If you want to LOAD a file with an extension other than "/PCL" then the file must be saved and loaded with your file name extension. Also see "DIR \*" above to display file names with extensions other than "/PCL".

**KILL DISK FILE****KILL filespec:n**

This command will delete a file from the disk. It will not cause anything to be altered in the memory. It will simply find the file, if it exists on the disk, and remove it from the directory.

If a file name extension is not specified, then the extension "/PCL" will be added to the filename.

EXAMPLE:

KILL EXAMPLE<ENTER>	- Deletes the file named "EXAMPLE/PCL" on the the first diskette on which the file is found.
KILL EXAMPLE:2<ENTER>	- Deletes the file named "EXAMPLE/PCL" on the diskette in disk drive two.

NOTE: The colon (:) is mandatory when specifying the drive specification.

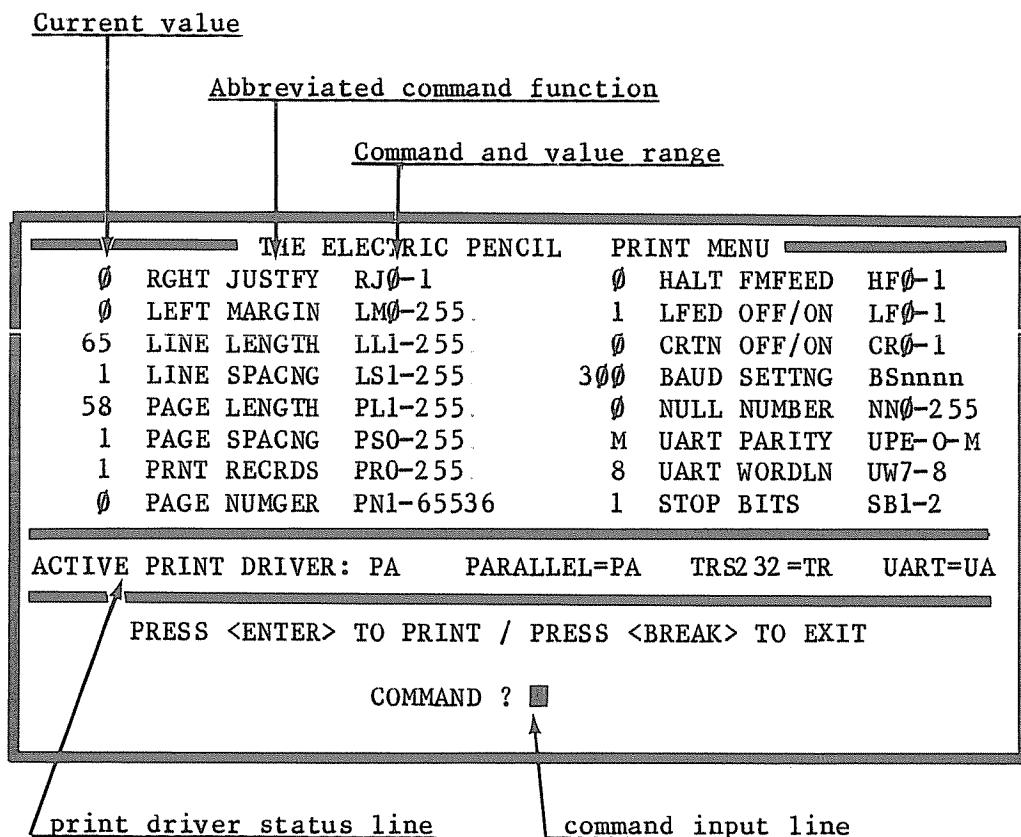
---

PRINT MENU COMMANDS AND THE SETTING OF PRINT VALUES

---

PRINTING A TEXT FILE

Entry to the PRINT MENU is accomplished by pressing the <CTL>-<P> keys. The screen will be cleared of all text and the PRINT MENU will be displayed.



NOTE: You may change the print value and printer control value settings to your preference at any time. See "SETUP" above. Print values and printer control values may or may not be saved with the text file. See "PVOFF and "PVON" above.

The print value commands and printer control commands are divided into three groups:

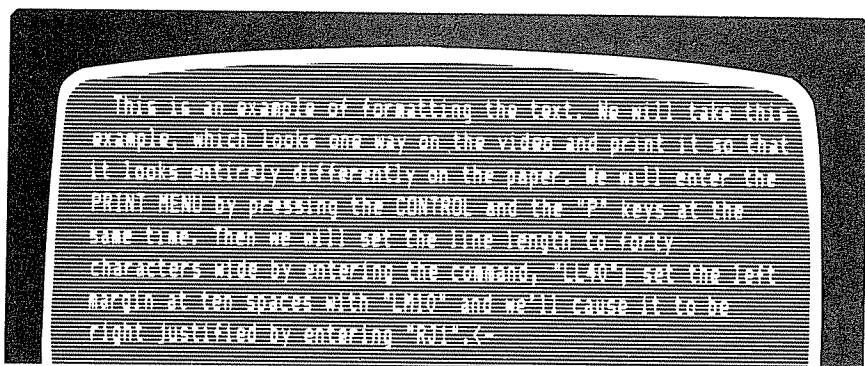
FUNCTION	ABBREVIATION	PAGE
<b>PRINT VALUES</b>		
Justify right margin . . . . .	RGHT JUSTFY . . .	69
Set left margin . . . . .	LEFT MARGIN . . .	70
Set line length . . . . .	LINE LENGTH . . .	71
Set line spacing . . . . .	LINE SPACNG . . .	72
Set number of lines per page . . . . .	PAGE LENGTH . . .	73
Set number of lines between pages . . .	PAGE SPACNG . . .	74
Set starting page number. . . . .	PAGE NUMBER . . .	75
Set number of records to print . . . . .	PRNT RECRDS . . .	76
<b>PRINTER CONTROL COMMANDS</b>		
Set printer to halt on form feed . . .	HALT FMFEED . . .	77
Line feed with carriage return off/on .	CRTN OFF/ON . . .	78
Carriage return with line feed off/on .	LFED OFF/ON . . .	79
Set RS232c baud rate (UART) . . . . .	BAUD SETTNG . . .	80
Set number of nulls on serial output .	NULL NUMBER . . .	81
Set parity on serial output . . . . .	UART PARITY . . .	81
Set number of stop bits (UART) . . . . .	STOP BITS . . . .	81
Set serial word length . . . . .	UART WORDLN . . .	81
<b>PRINTER PORT CONTROL</b>		
Select parallel printer port . . . . .	PA . . . . .	82
Select TRS232 serial/cassette port . .	TR . . . . .	82
Select RS232c (UART) serial port . . .	UA . . . . .	82

The PRINT FORMATTING commands and their VALUES are typed and the <ENTER> key is pressed. The values will be immediately set and displayed. This "menu" displays the value of the current PRINT VALUE settings, the PRINT VALUE mnemonics and the print driver that is currently active. Pressing the <ENTER> key will cause the text file to be printed on the line printer. Pressing the <BREAK> key will return you to the TEXT ENTRY mode.

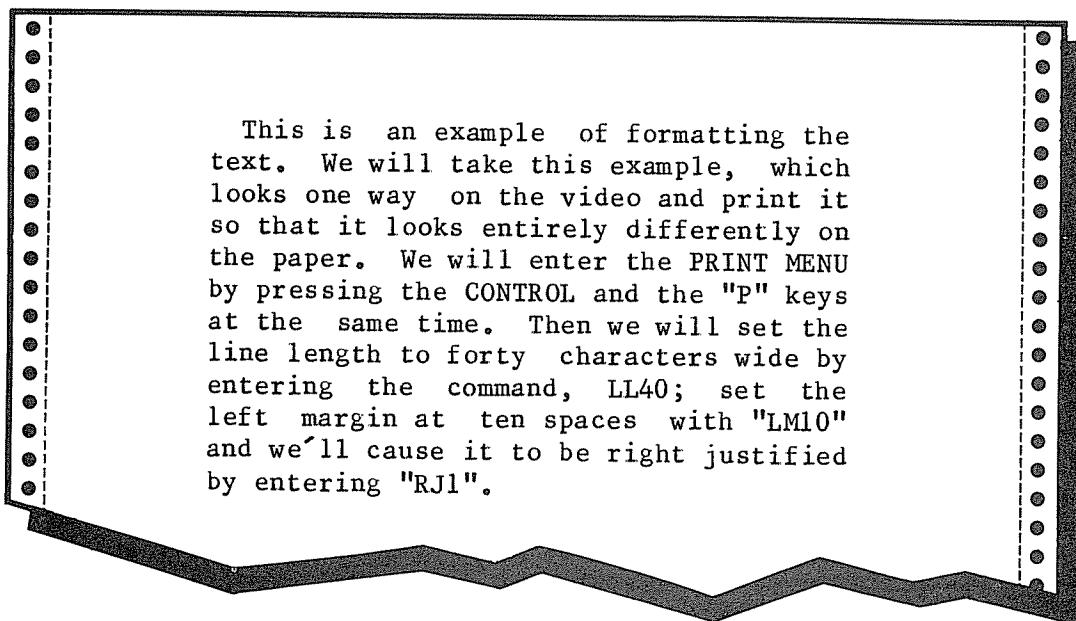
When a file is saved to tape, Stringy Floppy or diskette, the file print values are saved at the end of the file. When the file is loaded, the print values will be set according to the setting when the file was saved. Files saved under previous versions of THE ELECTRIC PENCIL will not cause the print values to be changed (i.e., "old" files are compatible with the "new" PENCIL).

To start printing your file from the current cursor position in the text to the end of the file, simply press the <ENTER> key and printing will begin immediately.

The format of the printed page is determined by the PRINT VALUES you have set up, prior to printing. For instance, suppose we had a block of text that looked like this on the video display:



It will look like the example below when we have formatted it as described in the example paragraph above and then cause it to be printed by pressing the <ENTER> key while in the PRINT MENU mode.



There are many more things that can be done with print formatting. The above example will give you a fair idea of what print formatting is all about. This manual is an excellent example of the versatility of The ELECTRIC PENCIL's print formatting capability.

#### THE ELECTRIC PENCIL PRINT DRIVERS

Three hardware printer interfaces are supported; the standard parallel printer interface, the RS232c serial interface (UART) and the Small Systems Software TRS232 serial printer interface (cassette port). THE ELECTRIC PENCIL automatically selects the parallel interface unless YOU tell it otherwise.

THE ELECTRIC PENCIL has three built-in print drivers and will accept any other print driver you wish to use (See APPENDIX II below; the PLOAD and PSAVE command above). The built in drivers are for the standard parallel printer, the Small Systems Software TRS232 print driver and a standard serial print driver for the UART or standard Radio Shack RS232c expansion option (See Appendix II below).

The Radio Shack serial interface options may be set from within the PRINT MENU. You do not have to physically set the switches within the expansion interface with the exception of the COMM/TERM switch which must be set to the TERM position on the MODEL I. This switch does not exist on the MODEL III.

PRINTING MULTIPLE COPIES

You may print your file up to 255 times (ideal for form letters) by entering a number prior to pressing the <ENTER> key while in the PRINT MENU. Here is an example that would cause the file to be printed twenty-five times:

COMMAND? 25 <ENTER>

Entering a 1 will have the effect of pressing <ENTER> without a number; the file will be printed one time.

**SPECIAL NOTE ON MULTIPLE COPIES:**

When printing multiple copies, and you want to have the first page of each copy start at the top of a page, BE SURE TO PUT A FORM FEED AT THE END OF YOUR FILE. This will cause the printer to skip to the beginning of a new page when the last page of the text file has been printed. Failure to put a FORM FEED at the end of the file, will cause the start of the next copy to begin printing one line below the end of the first copy instead of at the top of the next page.

PRINTER COMPATIBILITY

Some serial printers require fill characters (nulls) after each carriage return to allow time for the carriage to reach the home position. If, for example, your printer requires 5 fill or null characters (see your printer manual), you may set the number of nulls to be sent to the line printer after each carriage return by entering the command "NNn" where the 'n' may be any number between 0 and 255. Also see SET NUMBER OF NULLS, below.

Set up your printer by manually advancing the paper to the location where you want printing to actually start. Then place the cursor over the first character of the text that you want to print and type:

<CTL>-<P>

The PRINT MENU will be displayed. If all of the print values are set to your satisfaction, press the <ENTER> key and printing will start immediately, assuming that your printer is on and properly set up for printing.

Some printers will seem to ignore "blank lines". These are lines that you have specified as "blank" by putting a carriage return (<->) at the extreme left of the display. The Centronics model 779 is one of these printers. To correct this, you will have to precede a carriage return at the extreme left edge of the display, with a space.

Other printer control commands are the "line feed on/off" (LFn) and "carriage return on/off" (CRn) commands. Consult the manual for your printer to determine whether or not you may use these commands.

RECOVERING FROM A "HUNG PRINTER" CONDITION.

From time to time you may want to print something but for some reason or another, have failed to connect or turn on the printer. Most programs will hang-up until the printer is properly attached. THE ELECTRIC PENCIL will let you recover from this condition by pressing <BREAK>-<CLR>. Sometimes pressing the <BREAK> key by itself will regain control.

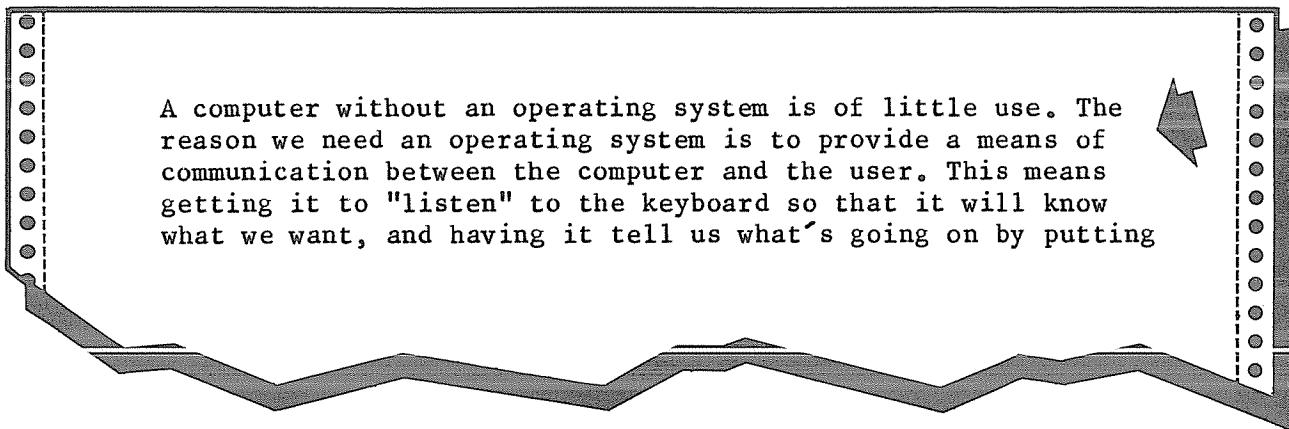
This abort feature works ONLY on the BUILT IN PRINT DRIVERS.

=====  
PRINT VALUES  
=====

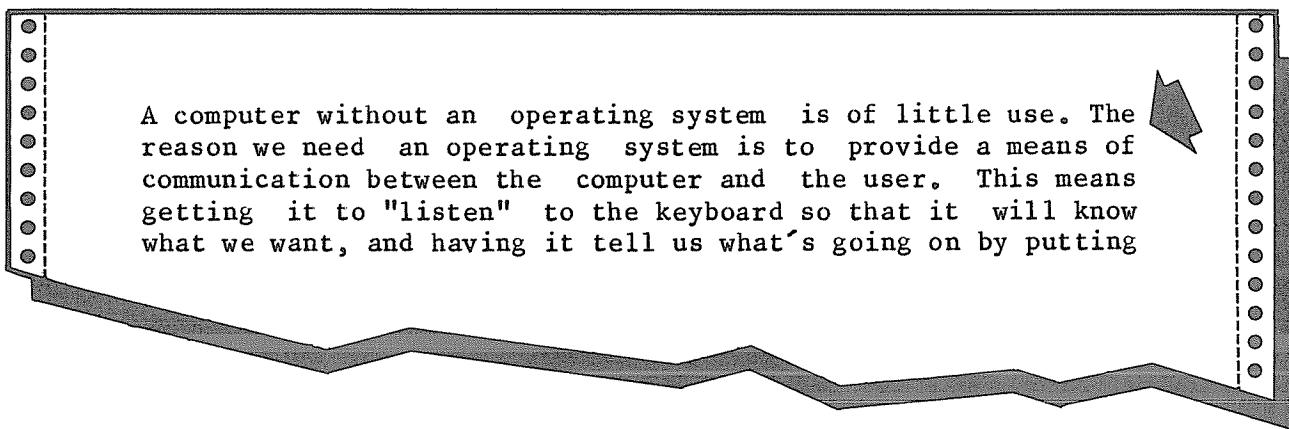
JUSTIFY RIGHT MARGIN                    "RJ0-RJ1"

To set the JUSTIFY parameter, enter the command, "RJ1". To turn off the JUSTIFY parameter, enter the command, "RJ0". Justification of text will cause each line to be printed to the maximum setting of the line length, with the last non-space character in the extreme right position on each line. The default value is  $\emptyset$ .

With the justification off ("RJ0"), file will be printed with the right hand margin "ragged" like this:



Setting the justification parameter to "RJ1" will cause to file to be printed with the right margin justified as follows:



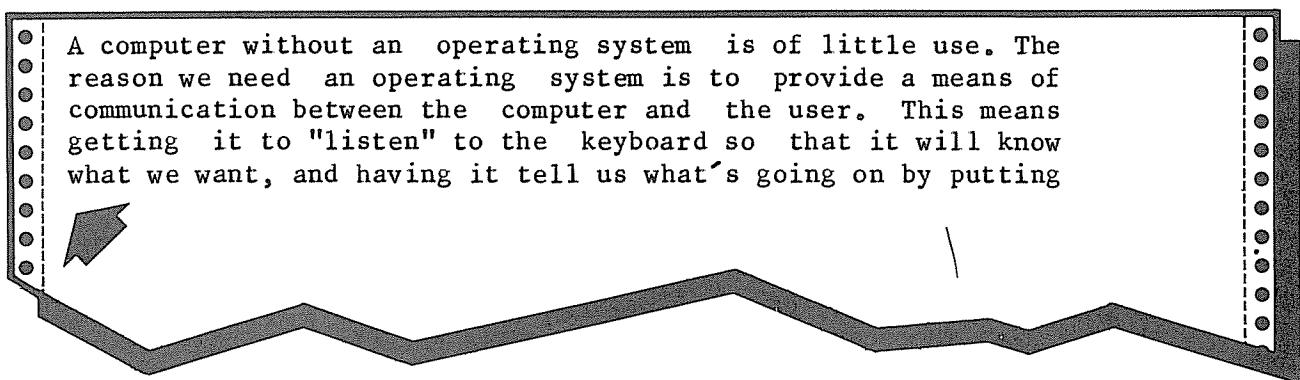
LEFT MARGIN"LM0 - LM255"

This sets the left margin. If your printer is an eighty column printer, you must be careful when setting your margins too far to the right. This will cause the printer to do one of two things depending on the line width you have set:

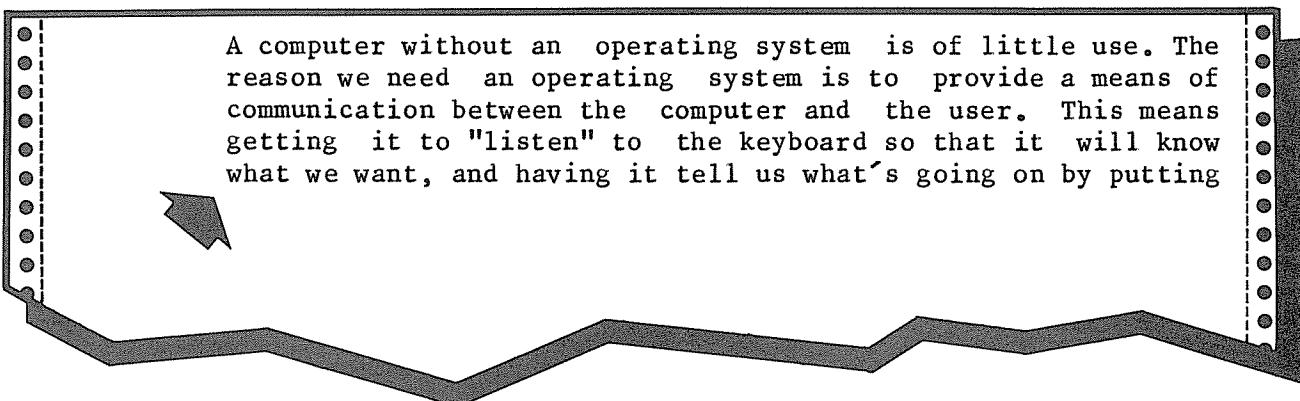
1. When the printer reaches the far right margin, it will stay at the right margin and print in one place.
2. When the printer reaches the far right margin, it will issue a line feed and carriage return of its own. The line will continue to print on the next line until THE ELECTRIC PENCIL issues a carriage return. The text will have extra lines and lines that are incomplete.

The default value is  $\emptyset$ .

With the left MARGIN setting at zero your file will print as follows:



With the left margin setting at 10 (LM10), your file will print as follows:

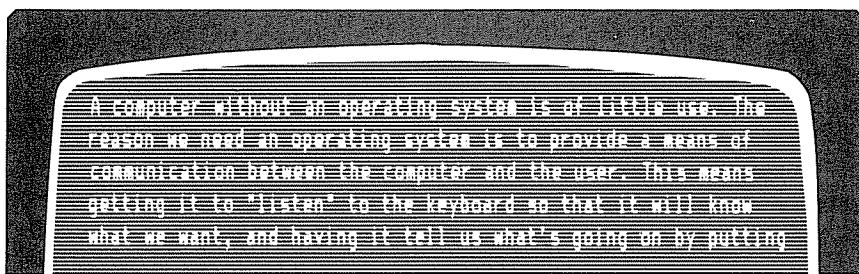


In the above example, justification is set to RJ1 (on).

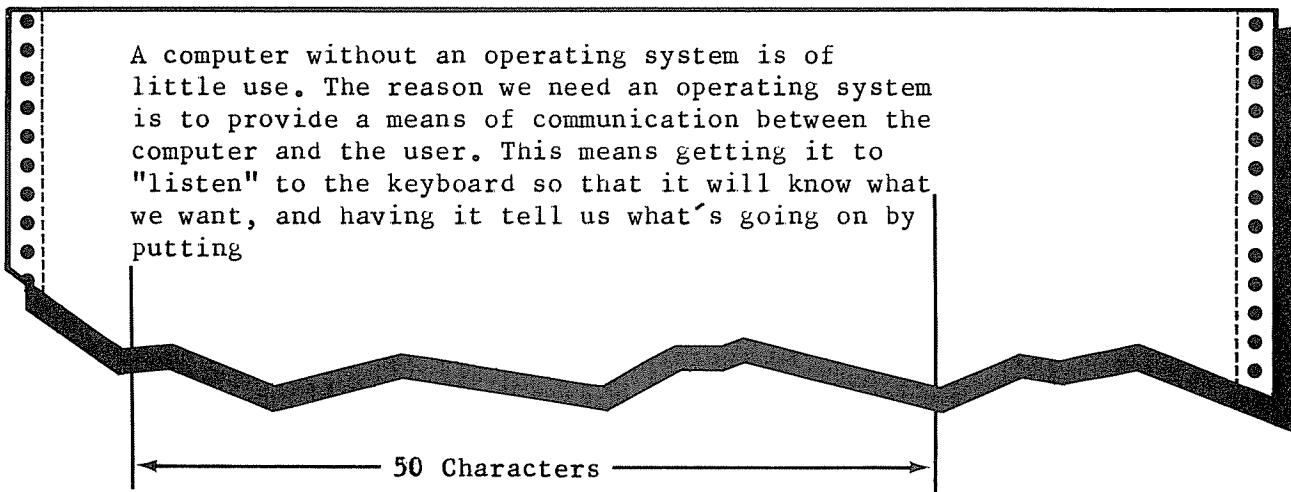
LINE LENGTH"LL1" to "LL2 55"

This sets the number of characters that will be in each printed line. When the RIGHT JUSTIFICATION is off, each line will be printed with the right margin ragged and words will not be broken in the middle of a word. When JUSTIFICATION is set, each line will be spaced out so that the last letter of the last word of each line ends at the maximum line length you have set. If JUSTIFICATION is NOT set, then instead of spacing out the line so that the right margin is even, it will fit as many words as possible on each line without adding any extra spaces between words.

For example, with the line length value set to 50 (LL50), a file that looks like this on the video display...



Will be printed like this...

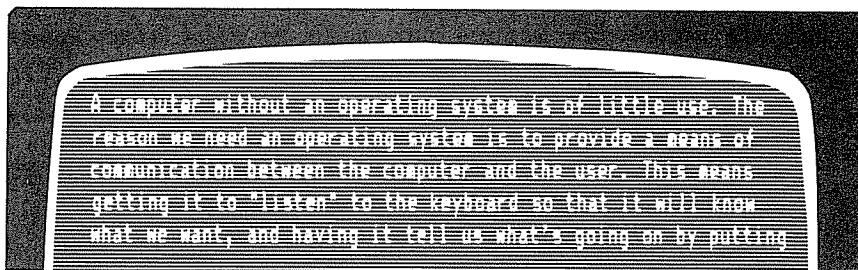


In the above example, right justification (RJ1) is not on.

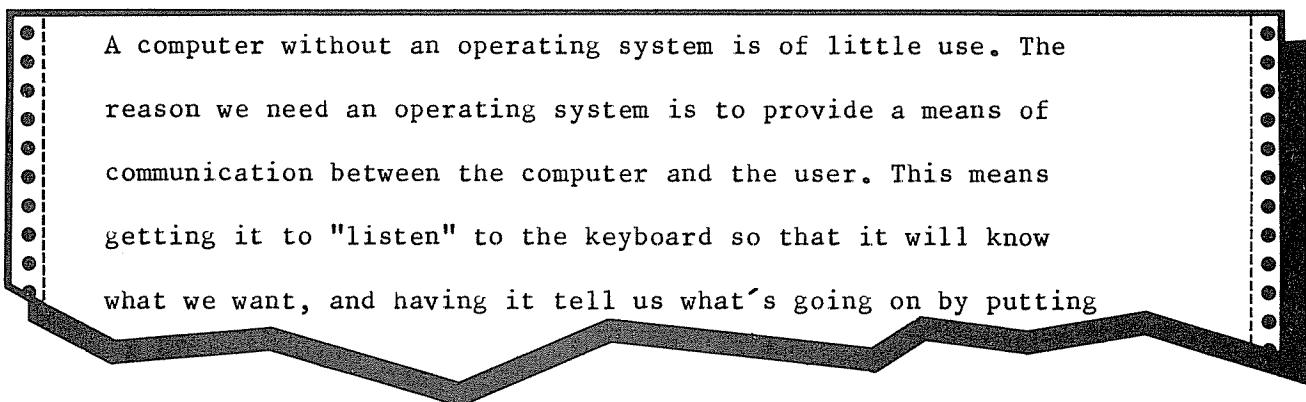
LINE SPACING                    "LS1" to "LS255"

This parameter sets the spacing between lines. "LS1" will cause each printed line to be spaced normally. "LS2" will cause each printed line to be double spaced, and "LS5" will have five spaces between lines. The default value is 1.

With line spacing set to two ("LS2"), a file that looks like this...



...will be printed like this:



THE ELECTRIC PENCIL will count blank lines in its PAGE LENGTH count. If you had set the page length at sixty (PL60; see below), there would be thirty text lines and thirty blank lines.

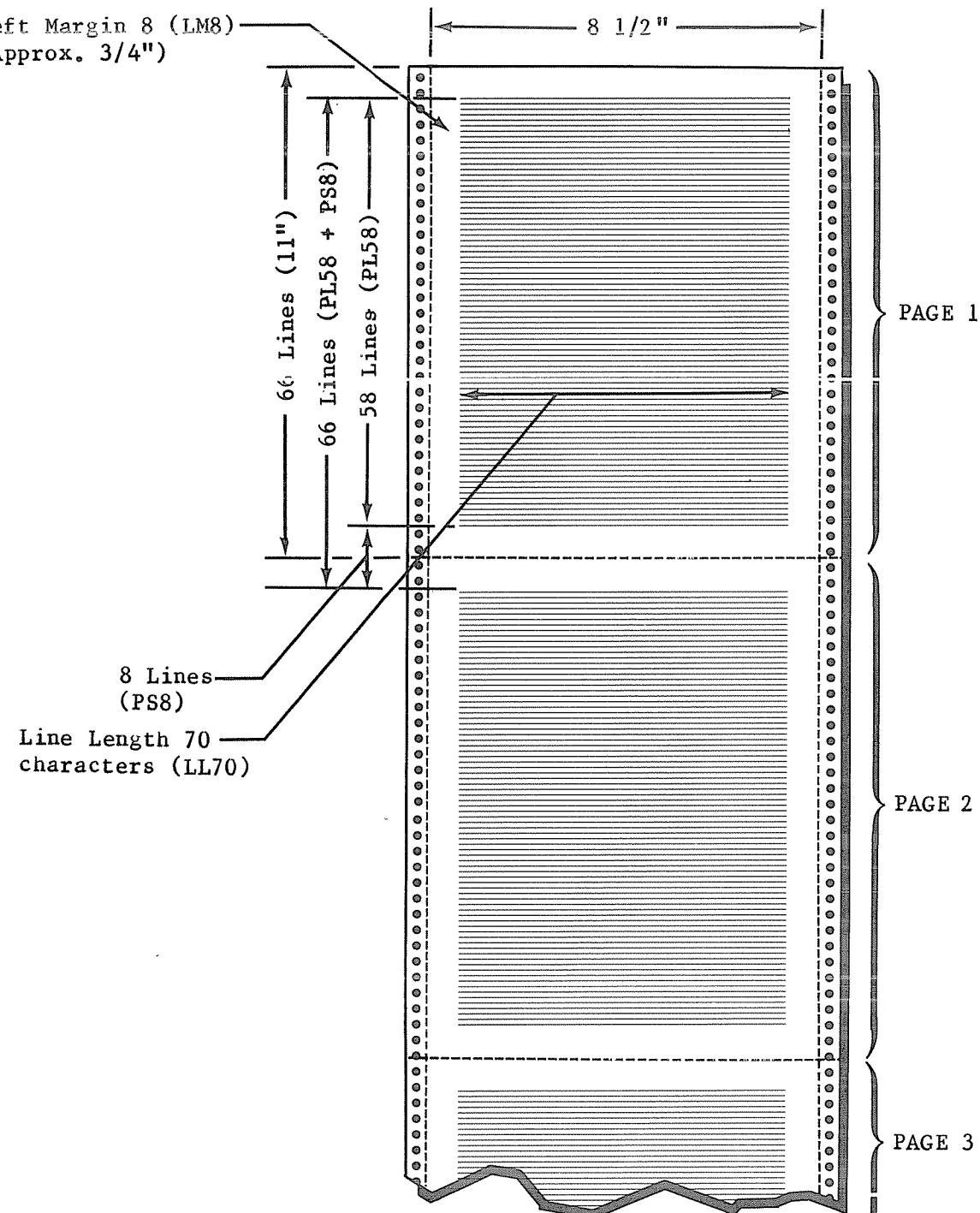
PAGE LENGTH"PL0" to "PL255"

This print formatting command sets the number of lines that will be printed on each page. A setting of "PL60" will print sixty lines per page. The default value is 58.

On paper that is continuous, this setting is important because it interacts with the PAGE SPACE command (See below) to set the number of lines that will be printed on a single page and the number of lines between pages.

A single 8 1/2" by 11" sheet (either continuous form or single sheet paper) has space for 66 lines, when printed solid from top to bottom with the line printer set at 6 lines per inch.

In the figure below, the relationship between the paper size PAGE LENGTH and PAGE SPACING will become apparent. This example is with 8 1/2" by 11" continuous form paper. The line printer is set to 6 lines per inch and the character spacing set to 10 characters per inch or PICA size letters.



PAGE SPACING"PS0" to "PS255"

This sets the number of lines between pages. On printer paper that is continuous, this setting is important. If it is set incorrectly then each page, after the first page will start higher or lower on each succeeding page. The default value is 8.

For proper page spacing, the values for "PL" (Page Length) and "PS" (Page Spacing) must total the number of lines per page. For instance, with the printer set for six lines per inch, a standard 8 1/2 by 11 inch sheet of paper has 66 lines. With the printer set at eight lines per inch, a standard sheet has 88 lines. In the first case, the values for "PL" and "PS" must total 66 and in the second they must total 88. Also see figure above.

PAGE NUMBER"PN0" to "PN65536"

To set the page number enter the number you want your pages to start at, type the number next to the "PN". Suppose, for example, you want your page numbering to start at "10". Type: PN10<ENTER>. When you start printing your file, start printing with the cursor over the dollar sign (\$) and the pages will be numbered automatically starting at "10". The default value is 1. Also see TITLING NUMBERING AND UNDERLINING below.

PRINT LENGTH (RECORDS)    "PR0" to "PR255"

This parameter "counts" the number of carriage returns that follow a group of words or characters that have been printed. It assumes that each carriage return following a group of words or characters represents a "record" or "paragraph". When "P" is set to zero, the number of records that will be printed is unlimited.

The default value is 0.

---

**PRINTER CONTROL COMMANDS**

---

These commands CONTROL the printer's actions but do not affect the PRINT VALUES as discussed above.

**HALT PRINTER ON FORM FEED OFF/ON "HF0" - "HF1"**

If you can use single sheets in your printer, this command will cause the printing action to stop each time THE ELECTRIC PENCIL issues a FORM FEED or spaces between pages. This will allow you to insert a new sheet of paper, position it, and then by pressing any key on the keyboard, the printer will continue until it reaches the end of the file or the next FORM FEED.

The default value is 0 (off).

**CARRIAGE RETURN OFF/ON "CR0" - "CR1"**

This command controls the sending of a carriage return to the line printer when the end of a line is reached. This command is required by most Centronics printers to be on.

CR0 = Carriage return OFF.

CR1 = Carriage return ON.

The default value is 1 (on).

**LINE FEED OFF/ON "LF0" - "LF1"**

This command controls the sending of a line feed to the line printer when the end of a line is reached. This command is required by most Centronics printers to be off.

If you are getting extra spaces between lines, or have a requirement for underlining, "LF" should be set "LF0".

LF0 = Line feed OFF.

LF1 = Line feed ON.

The default value is 0 (off).

NOTE: LOCAL LINE FEED, on your printer, must be off in order to underline. See UNDERLINING below.

SERIAL BAUD RATE SETTING "BSnnnn" (UART and TRS232)

This command will set the baud rate for the Small Systems Software print driver and the UART (TRS-80's RS232c serial interface). 'nnnn' can be any valid baud rate setting as listed below. Baud may be reset at any time. The default value is 300 baud.

110*	134.5*	150	300	600	1200	2400	4800	9600
------	--------	-----	-----	-----	------	------	------	------

Entering a baud rate not in the above list will cause the error message, "SYNTAX ERROR" to be displayed.

\* NOTE: The selection of 110 or 134.5 baud will automatically set the number of stop bits to 2. If you require a different number of stop bits set when baud is set at 110 or 134.5 you will have to RESET the stop bits AFTER setting the baud rate at 110 or 134.5. The selection of any other baud rate automatically sets the number of stop bits to 1 which may also be reset if you desire two stop bits.

SET NUMBER OF NULLS "NN0" to "NN255" (UART and TRS232)

Some serial printers require that "fill" or "null" characters be sent after each carriage return to allow enough time for the carriage to reach its home position. If your printer requires five null characters, for example, set the null output by entering "NN5" from the PRINT MENU. The number of nulls may be reset at any time. The default value is 0.

SET UART (RS232c) PARITY "UPE" - "UPO" - "UPM" (UART)

"UPE" sets parity EVEN. "UPO" sets parity ODD (NOTE: "0" is the letter "0", not the number zero.). "UPM" sets parity to MARK or NO PARITY. Default VALUE is set to M.

SET STOP BITS "SB1" to "SB2" (UART and TRS232)

Sets the number of stop bits at one or two. The default value is 2. Stop bits are automatically set to "2" when the baud rate is set to 110 or 134.5 but may be reset to "1".

SET WORD LENGTH "UW7" - "UW8" (UART)

Sets the word length to seven or eight bits. The default value is 8.

Whether or not you will use these commands will depend upon your printer. Refer to your printer's documentation to determine the requirements necessary for its operation. We have set the default values to those most commonly used.

=====

PRINTER PORT SELECTION

=====

PARALLEL PRINTER ACTIVE "PA"

If you have activated another print driver (see below), you may re-activate the parallel printer driver by entering "PA" from the PRINT MENU. When the Parallel print driver is active, the status line will display as follows:

ACTIVE PRINT DRIVER: PA

NOTE: When using a custom print driver (see Appendix II), the "PA" command sets the printer DCB to your custom print driver. NOT the parallel driver. Also see ACTUATING SPECIAL PRINT DRIVERS below.

SMALL SYSTEMS TRS-232 PRINTER PORT ACTIVE "TR"

This command activates the Small Systems Software serial printer port. This port is the cassette port or port 'FF' hex. When this port is active, the status line will display as follows:

ACTIVE PRINT DRIVER: TR

RS232c SERIAL PORT (UART) ACTIVE "UA"

This command activates the standard RS232c serial printer port. When the serial port is active, the status line will display as follows:

ACTIVE PRINT DRIVER: UA

ACTUATING SPECIAL PRINT DRIVERS

All print drivers loaded with the PLOAD command take over the functions of the normal parallel driver, no matter which port they output to and are actuated with the "PA" command. When you have loaded a print driver with the PLOAD command, the normal parallel driver cannot be reactivated.

---

 ADDITIONAL NOTES - TITLING, NUMBERING & UNDERLINING
 

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TITLING PAGES and PAGE NUMBERING

Pages may have title headings as in this manual by entering the following information at the beginning of the file onto the video display:

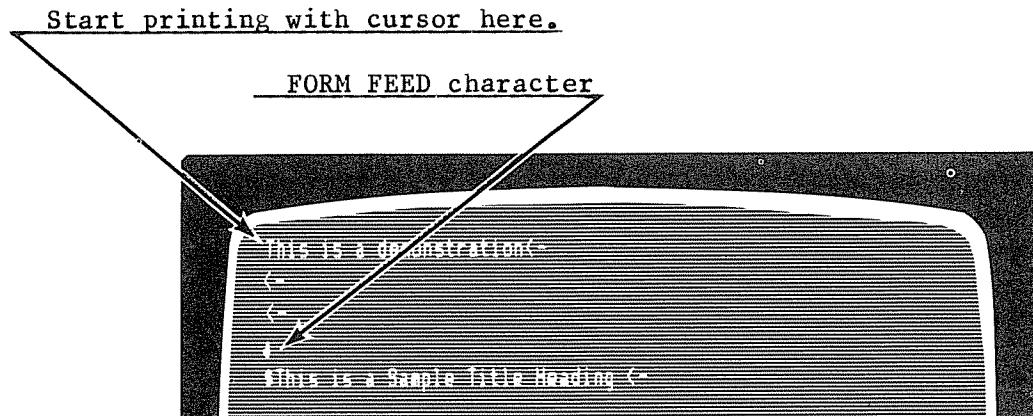
\$This is a Sample Title Heading ←  
 ↑  
Start printing with the cursor here.

In the above example, a dollar sign (\$), MUST precede the title and "ENTER" MUST be typed after the title text. In order for the title to appear in printing as a title, printing MUST start with the cursor directly over the dollar sign (\$) or follow IMMEDIATELY after a FORM FEED character. Otherwise, the title will be printed as regular text and will appear only once.

If the title length is greater than the line length "LL" minus 10, selected in the SYSTEM MENU, the title text will appear on the printed page as regular text and the page number will NOT be printed.

Whenever a title heading is used, pages will automatically be numbered at the extreme top right of each page. If page numbering is desired without a page title, only the dollar sign (\$) is used. Printing must begin with the cursor directly over the dollar sign (\$) or the dollar sign must follow a FORM FEED character.

In the course of printing, title headings may be changed by placing additional title headings into the text. The Electric Pencil will recognize these ONLY if they appear directly after a FORM FEED character, a down arrow on the MODEL I and a diamond on the MODEL III.



The new title heading will then appear on all subsequent pages unless another title is inserted immediately after a FORM FEED. Page numbering will remain sequential throughout. The starting page number will always be 1 unless set otherwise from the PRINT MENU.

## UNDERL INING

You can underline ONLY if your printer is capable of executing a carriage return WITHOUT executing a line feed. Most Selectric and some Centronic printers are not capable of underlining because of this requirement.

There is no underline key on the TRS-80. To generate the underline character, hold down the <CONTROL> key and press the <0> key once for each underline character you want to print. If you continue to hold down the <0> key, it will repeat the character as long as you continue to hold BOTH keys down.

EXAMPLE: enter the following example into the text buffer so that it looks like this:

This is a test of the underline ←

Now print it and it will look like this:

This is a test of the underline

Here is another example of an underline. Type it into the text buffer so that it looks like this:

This is another underline test.←

Print it and it will look like this:

This is another underline test.

If these examples do not work on your line printer and you are sure that it is capable of underlining, turn off the printer's "LOCAL LINE FEED". In this way, THE ELECTRIC PENCIL will control the printer's line feed and carriage return functions. On some printers (such as the Centronics MODEL 779) underlining will not be possible.

Words or phrases may be underlined ONLY in lines shorter than the line length you have specified with the "LL" command AND terminated with an <ENTER> character. You may not underline a word or phrase within justified text without taking extraordinary measures to ensure that the underline is printed in exactly the right place. It is possible, but not advisable unless you enjoy experimenting.

To illustrate my point, the above paragraph has an underline embedded within justified text! It is just below the <ENTER> on the second line. It took me several minutes to set this up and the figure below is exactly how it appears on my video screen EXCEPT I have added the slash=b characters (þ) IN PLACE OF SPACES so you can SEE how many spaces are between letters.

This example is particularly extreme because the underline appears at the very end of the line. The extra spaces required in order to cause everything to "space-out" correctly are very important and require some trial and error to work out. With a little experience you can come close on a first or second try but it's still tough.

You will also notice that the "justified" line preceding the underline line, is one character short of 80 characters and terminated with an <ENTER>. This is necessary since the line HAS to be terminated with an <ENTER> character and the program will count the <ENTER> character as part of the last character of the last word - if the line was one character longer, the word "length" would have been placed on a line by itself. I also had to justify the line myself, spacing the words so that they appeared to be justified.

Needless to say, this is a complicated procedure but if it is absolutely necessary to embed an underline within text, it can be done... nothing is impossible!

---

SPECIAL TECHNIQUES, "TRICKS" & TIPS

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One of the things that makes a program like THE ELECTRIC PENCIL especially valuable is the ability to use it for a variety of purposes. There are many uses that PENCIL can be put to and we will explore some of these. There are probably some that you will think of yourself that are not covered here. This section will provide you with some ideas... the rest is up to you.

WRITING BASIC PROGRAMS USING THE ELECTRIC PENCIL - (Disk systems) - This is an easy one. All you have to do is type in your program. SAVE it then go to BASIC and LOAD or RUN it as you would any other program. The program you SAVE from PENCIL is stored in the ASCII format so you can MERGE it with an existing program.

The advantage of writing a BASIC program in PENCIL is that you will have all of the advantages of a "full screen" editor. You can "crunch" (remove all spaces) a BASIC program by using the SEARCH & REPLACE function of THE ELECTRIC PENCIL.

You may also LOAD a program you have created in BASIC by SAVEing it with the ASCII option if you have a disk system. You will then be able to LOAD it into THE ELECTRIC PENCIL without any other modifications to the program.

As a program text editor, PENCIL is also very handy for making "global" changes such as changing all "PRINT" statements to "LPRINT" or changing variable names. A "PENCILIZED" file can also be "pretty printed" for documentation purposes.

VISICALC® FILES - (Disk systems) - VisiCalc is one of the most popular programs available, and for good reason: it works and performs many complex tasks. It is kind of a "word processor for numbers" or perhaps a "number processor". Like THE ELECTRIC PENCIL, its uses are many and varied. Of course you can save a VisiCalc file using the "data interchange" format and load it into THE ELECTRIC PENCIL and work on the "output file" as if you had created it using a word processor. That's an obvious use of the THE ELECTRIC PENCIL/VisiCalc combination. The following is not.

THE ELECTRIC PENCIL can also be used to make listings of your VisiCalc formula entries to each row and column. I know that I wanted to get listings of the various formulas I had entered into my VisiCalc program. The only provision that VisiCalc has provided for this is to display your entry in the upper left hand corner of the screen when VisiCalc's cursor is on a particular row and column. About the only way you could get a listing of your formula entries is to copy them by hand as you scan the cursor over the "electronic worksheet".

Have heart, O-stalwart knight of the keyboard, there are ways and they are so simple! First of all, you must understand how VisiCalc saves its files: they are plain vanilla ASCII files. Each row-column position is stored with all of the information pertaining to that row-column position and terminated with a carriage return. For starters, take a VisiCalc file you have saved and from the "DOS READY" message type:

MODEL I	MODEL III
PRINT filename/VC<ENTER>	LIST filename/VC (PRT,ASCII)<ENTER>
or	or
LIST filename/VC<ENTER>	LIST filename/VC (ASCII)<ENTER>

In the first instance, "PRINT" will send the listing to the line printer and "LIST" will send the listing to the video display. That will give you the long sought "formula" listing.

Another way of listing your original VisiCalc entries is to simply load the file into THE ELECTRIC PENCIL. Simply use the full file name when you load it into PENCIL. Be sure include the file name extension. The file will load and you can alter it, list it using THE ELECTRIC PENCIL's print function or create VisiCalc source files.

VisiCalc saves its files beginning with the lower right most entry, working from right to left and bottom to top. When all of the row-column entries have been saved, it then saves its "global" program-display parameters.

For this illustration I will use a nonsensical-simplistic example but you may enter larger and of course, more meaningful entries for your own experiments.

VisiCalc "source"	
File	Comments
>D5:@SUM(A3...D3) .....	Row 5 entry
>D4:"-----" .....	Row 4 entry
>D3:@SUM(D1...D2)	... Row 3 entries
>C3:@SUM(C1...C2)	
>B3:@SUM(B1...B2)	
>A3:@SUM(A1...A2)	
>D2:+D1/.7789	... Row 2 entries
>C2:+(C1*22)/45	
>B2:+B1*15.77	
>A2:+A1*56.88	
>D1:/FI9.66	... Row 1 entries
>C1:/FI6.77	
>B1:/FI35.4055	
>A1:/FI23.156	
/W1	... Display/global parameters
/GOC	
/GRM	
/GFG	
/GC9	
/X>A1:>A1:	

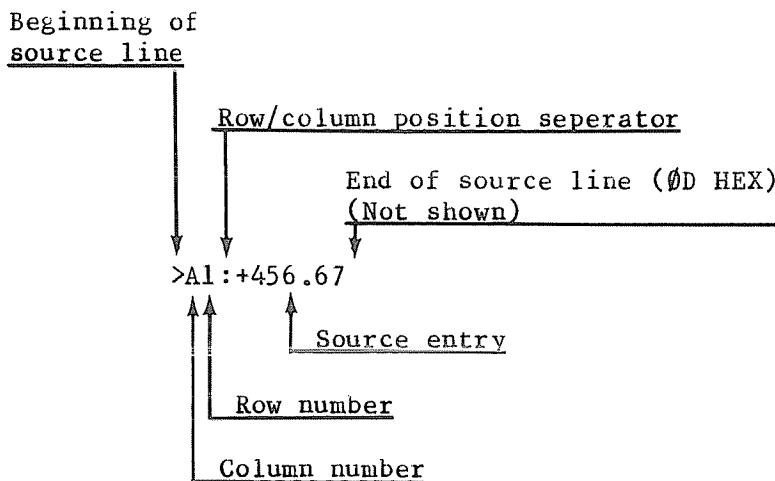
The above VisiCalc "source" file will load and display just as if you had used VisiCalc to create it. (Do not enter the comments on the right and be sure to enter a carriage return at the end of each row-column entry.) It is possible to enter the VisiCalc "source" file in any order, such as an "inverted" order as follows:

```
>A1:  
>A2:  
>A3:  
.  
.  
.  
>D5:
```

Since this is not exactly how VisiCalc expects to receive the file, it will load slower than molasses on a cold winters morn but VisiCalc will eventually sort out the mess you have created and put everything in its correct place.

Here is the VisiCalc notation format:

#### ROW COLUMN ENTRIES



In the below example, "/FI" has been added to the source line. This denotes that the display is to be in INTEGER format.

>A1:/FI456.67

In the next example there is no formula or numerical data, instead there are alpha characters that are to be treated as a "label". The VisiCalc program "knows" that a row/column field is a "label" because it starts with quote marks as shown:

Quote indicates that data record is a "label"  
>A1:"This is a test

The last thing that VisiCalc loads are the display/global parameters. These set the window mode, the global re-evaluation mode, recalculation mode, format mode, column width and cursor position. The row-column source statements are preceded by the ">" character. This information is preceded by the slash "/", character. The format for this information is as follows:

/W1	- Window mode = '1' (normal display)
/GOC	- Global revaluation mode = Column
/GRM	- Global recalculation mode = manual
/GFC	- Global format mode = general format
/GC9	- global column width = 9
/X>A1:>A1:	- Cursor position coordinate

Remember, each of the above "data records" is terminated with a carriage return.

If the thought has not yet occurred to you, then let me give your creative juices a jab - THE ELECTRIC PENCIL is an excellent "data recovery" tool for VisiCalc source files. If you "lose" a valuable VisiCalc file and need to reconstruct it, then using the methods I have outlined in "TRS-80 Disk & Other Mysteries", you may recover to the extent that you can LOAD it into PENCIL and then use PENCIL to reconstruct the missing parts!

One more thing, for all you VisiCalc fans that have lost a file in memory, here is a restart address you can use: 6906 HEX.

EMBEDDED LINE PRINTER CODES - This little trick will work on disk, tape and Stringy Floppy Systems. True, it is a seemingly 'clumsy' way to embed printer codes, but it works never the less. Of course you will need a "smart" printer like an Epson, Qume, Diablo or NEC that will respond to the embedded printer codes. Since each printer has a different set of codes to do the same things or different things, it is not possible to make a "universal" printer code file, I will tell you how to create your own. But first, let me tell you how it works.

In order to "talk" to the printer without having it print something, we have to send it a special character, then what we send it will be interpreted as an 'instruction' and not a character. Usually this is the "escape code" character - in English, this means that it is an ASCII character with a code number of 27.

Following the "27" there are usually one or more additional characters that the printer will interpret as the actual instruction and finally, a carriage return which will signal the printer that we have completed our instructions to it.

Here is a typical conversation between your computer and printer:

HUMAN: Here is something I want you to send to the  
printer: LPRINT CHR\$(27);CHR\$(125);"J"<ENTER>

COMPUTER: Hey guys, wake up - we have something coming in.

OPERATING

SYSTEM: Yes, wait a nanosecond - it looks OK to me - no  
syntax errors. Hey video, display this, OK?

VIDEO: Got it. Its up on the screen.

COMPUTER: All right then, I'll send it to the printer.  
Hey, printer! Are you ready to print something?  
(Sends a "request to send data" signal)

PRINTER: Yeah, I'm ready. Send it. (Sends a "data terminal  
ready" signal)

COMPUTER: OK, here it is. Here is an ASCII code 27.

PRINTER: Thanks. Waitaminute. I can't print this, its a  
code that means I'm supposed to set myself up for  
something else.

COMPUTER: Right! Here is the next code, its an ASCII 125

PRINTER: Thanks again, but what else is there?

COMPUTER: Well, I have a letter "J".

PRINTER: Fine, fine, anything else?

COMPUTER: Yep, here is a carriage return, an ASCII 13.

PRINTER: OK, then THAT'S the end of it. Now let's see, I have a 27, a "125" and a "J". Hmmmm, that means that I am supposed to set my line spacing to ten one hundred twentieths of an inch per character typed. Thanks, computer. Give my regards to your human.

COMPUTER: Sure thing. OK system, send a "READY" to the video so the human will know that everything is OK.

OPERATING

SYSTEM: Coming up. Video?

VIDEO: Video ready.

OPERATING

SYSTEM: Print a "READY" for the human.

VIDEO: Roger the "READY". Now what?

COMPUTER: That's it. Now we wait and see if he wants to do anything else. Keyboard scan -- be alert in case he types anything.

KEYBOARD: Roger. I'm waiting.

HUMAN: Hey, Charlie, The line printer is set for 12 characters per inch do you want me to list this program?

With this little exchange, the printer is set to print 12 characters per inch, elite spacing. This particular code is for a NEC printer. Your printer codes will probably be different. The process is simple enough but the problem is; how do we send these codes to the printer from THE ELECTRIC PENCIL when THE ELECTRIC PENCIL cannot generate ASCII codes below 32 and above 124?

The answer is obvious - we simply make a file with all these codes in them and use the BLOCK MOVE to put them where we want. (Did I see a light bulb appear over your head?) So, now we know WHAT to do, let's look at HOW we can do it.

THE ELECTRIC PENCIL text files are plain vanilla ASCII files. Each byte of a "normal" ELECTRIC PENCIL file contains the ASCII code for each byte of the text file you originally had in memory. Carriage returns are stored as an ASCII '13' - which is the normal ASCII character for a carriage return. THE ELECTRIC PENCIL puts an ASCII code '00' at the end of each file. The conclusion here is that what you see is what you get. It's simple and straight forward.

Now that we know the format of the file here is how we generate it. We simply write a BASIC program that will make an ASCII file, with the codes in it that we want, and then load it into THE ELECTRIC PENCIL WHEN WE WANT TO USE IT! Here are two programs. The first is for a disk system and the second is for tape. The tape or the disk version can be adapted to create a data file on the Stringy Floppy with little or no trouble.

Since the first task that must be accomplished before you can do this trick is to create the codes that we will embed into the text. Go to BASIC and enter this program or enter it into THE ELECTRIC PENCIL. Remember, do not forget to put a carriage return at the end of each BASIC line and to SAVE the program with the cursor over the "1" of the "10".

DISK VERSION

```

10  REM ****
20  REM      ELECTRIC PENCIL PRINTER CONTROL FILE - DISK
30  REM      PROGRAM: CODEGEN
40  REM      FILENAME: PRINTCTL/PCL
50  REM ****
60  REM
70  CLEAR 1000 : CLS
80  PRINT@448, "WORKIN' HERE BOSS...."
90  OPEN"O",1,"PRINTCTL/PCL"
100 FOR X=1 TO 31
110 PRINT#1, "ASCII CODE";X;" ---->";CHR$(X);CHR$(13)
120 NEXT X
130 FOR X = 91 TO 255
140 PRINT#1, "ASCII CODE";X;" ---->";CHR$(X);CHR$(13)
150 NEXT X
160 PRINT#1, CHR$(00)
170 CLOSE
180 PRINT@448, CHR$(31); "ALL DONE HERE BOSS..."

```

TAPE VERSION

```

10  REM ****
20  REM      ELECTRIC PENCIL PRINTER CONTROL FILE - TAPE
30  REM      PROGRAM: CODEGEN
40  REM
50  REM ****
60  REM
70  CLEAR 1000 : CLS : PRINT@ 468,"READY CASSETTE & PRESS ANY KEY"
80  IF PEEK (14591) = 0 THEN GOTO 80
90  PRINT@448, CHR$(31);"WORKIN' HERE BOSS...."
100 FOR X=1 TO 31
110 PRINT#-1, "ASCII CODE";X;" ---->";CHR$(X);CHR$(13)
120 NEXT X
130 FOR X = 91 TO 255
140 PRINT#-1, "ASCII CODE";X;" ---->";CHR$(X);CHR$(13)
150 NEXT X
160 PRINT#-1, CHR$(00)
170 PRINT@448, CHR$(31);"ALL DONE HERE BOSS..."

```

Now that you have the program saved onto the disk, (or tape), go to BASIC and RUN it. It will create a file which will be called "PRINTCTL/PCL". When that file is created, return to THE ELECTRIC PENCIL and LOAD the PRINT/CTL file. You will now have a file that looks something like the next figure. I say "something" because I am unable to print all of the characters that you can see on your video screen. I have had to make an APPROXIMATION of that file and of course, the figure below is much shorter than the actual file that you will load.

ASCII CODE 94	----->^
ASCII CODE 96	----->`
ASCII CODE 123	----->{
ASCII CODE 124	----->
ASCII CODE 125	----->}
ASCII CODE 126	----->~

The next task is to find out if any of the characters in this file make your printer go crazy. So we will have to print the file on the line printer. The first thing you will notice is that the first seven ASCII codes cause the program to stop printing. Skip these, one at a time if you wish - until the printer will continue to run to the next line. You can also eliminate the ASCII code 12, since this is the down arrow and will simply print a FORM FEED. There may be other characters you will want to eliminate after printing the file. Once you have narrowed it down to the characters you want to keep, then construct a file that has the printer control functions with similar codes grouped together. Once again, I will have to use an approximation of what my file looks like but it's something like this:

FILE: PRINTCTL	
SET TO 9 CPI	-----> @}M
SET TO 10 CPI	-----> @}L
SET TO 11 CPI	-----> @}K
SET TO 12 CPI	-----> @}J
SET TO 13 CPI	-----> @}I
SET TO 5 LPI	-----> @}X
SET TO 6 LPI	-----> @}W
SET TO 7 LPI	-----> @}V
SET TO 8 LPI	-----> @}U
SET TO 9 LPI	-----> @}T
SCRUNCH PICA	-----> @}X@}K
UNSCRUNCH PICA	-----> @}U@}J
SCRUNCH ELITE	-----> @}V@}I
UNSCRUNCH ELITE	---> @}W@}L
SPECIAL CHAR ON	--> @
SPECIAL CHAR OFF	--> @
SET LEFT MARGIN	--> @M
RESET LEFT MARGIN	> @@
HORIZ TAB	-----> @@J
VERTICAL TAB	--FWD> @Z@
VERTICAL TAB	--REV> @Y@
CARET MARK	---> ^
LEFT APOST	-----> `
LEFT BRACE	-----> {
VERTICAL BAR	----->
RIGHT BRACE	-----> }
WIGGLE	-----> ~

In order to make the various combinations of codes necessary for the above file, I used THE ELECTRIC PENCIL's block move capability to "build" the codes. For instance, my NEC printer manual says that an ESCape("Y", "Z" will cause the printer to do a reverse vertical tab of 58 lines. This particular command was easy because all I had to do was add the "Y" and "Z" to the ESCAPE code (ASCII 27) and viola! A reverse vertical tab was born.

A more complex code was "SCRUNCH ELITE". Here, there are actually two codes for my printer. One to squeeze the letters closer together (13 characters per inch) and one to squeeze the lines closer together (7 lines per inch). I should point out that normal elite line spacing is 8 lines per inch but, that was too close for me - it made the text look "too black".

The code to set the letter spacing for my NEC printer, is:

ESCAPE + ASCII code 125 + I

The code to set the line spacing for my NEC printer is:

ESCAPE + ASCII code 125 + V

First I built the ESCAPE and the ASCII code 125 and added the letter "I" to it. Then I duplicated that and changed the "I" to a "V". Finished. Using those I created the rest of the codes that I might commonly use. Those that I never used were eliminated from the file and later some were added.

You will have to create a file to fit your needs and your printer.

One word of caution: THE ELECTRIC PENCIL will count the embedded characters as if they were regular characters and for that reason, you may find that you will have to go to some extraordinary lengths to make a line appear "justified".

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**SPECIAL "TRICKS"**

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**DOUBLE STRIKING - (MEDIUM BOLD FACE CHARACTERS)** When THE ELECTRIC PENCIL is set for underlining, it does not count any lines with the underline character(s) in it. We can use that to our special advantage for making double strike letters and letter combinations. Here is an example of "double strike" letters:

**THIS IS AN EXAMPLE OF MEDIUM BOLD FACE.**

In order to do this bit of "magic" I caused the line to be printed three times. This was done by using the underline character in front of each line. The underline character was printed but, before this manuscript was sent to the printer, I simply WHITED OUT the underline character. It originally looked like this, on the paper (note the underline character):

**❶ THIS IS AN EXAMPLE OF MEDIUM BOLD FACE.**

It will look like this on your video screen:

**— THIS IS AN EXAMPLE OF MEDIUM BOLD FACE.**  
**— THIS IS AN EXAMPLE OF MEDIUM BOLD FACE.**  
**THIS IS AN EXAMPLE OF MEDIUM BOLD FACE.**

**EXTRA BOLD FACE LETTERS** - This is a mixture of the above. First we will print the line with the underline character then we set the printer so that it spaces 1/120th of an inch per character, print one space at that setting, then reset it for normal spacing and then print the line again. The results will look like this:

**THIS IS AN EXAMPLE OF EXTRA BOLD FACE.**

This is how it will look on your Video screen:

**— THIS IS AN EXAMPLE OF EXTRA BOLD FACE.**  
**①A ①J — THIS IS AN EXAMPLE OF EXTRA BOLD FACE.**

It is obvious that the screen is quite different from the final printed version. The lower line with the embedded codes is off-set from the upper line. This is because printer control characters are not printed by the printer but are printed by the video. Therefore our video display does not correspond to the final product.

You will also notice that there is a SPACE between the two printer control codes. This is absolutely necessary. If we eliminate the space, we will not get our 1/120th of an inch off-set that makes our double strike letter appear bolder and two spaces are too many. This same trick can also be used to make "double-strike" characters such as a slash- "b":

**þ**

With a little creative thinking on your part, you can print multiple columns per page - just like a newspaper, "scrunch" your text for newsletters, make bold face headlines and so on. A little experimentation and who knows what you'll come up with.

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**GOOD COMPUTER PRACTICES**

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There is nothing that is more aggravating than losing an important text file or diskette. There are several methods for recovering important data on the diskette and sometimes, from memory, but these techniques are extraordinary. This type of data recovery is covered in "TRS-80 DISK & Other Mysteries" by H.C. Pennington and is available from most book stores, computer stores and from IJG directly.

Our discussion here will simply concern some rules of good computer practices. In writing this manual, the text files were saved on diskette. It would have been a disaster of the first order if we had saved our files to only one diskette and through some trivial accident, had the diskette "zapped" with static electricity, put a dent into the diskette, touched the diskette's magnetic coating with a finger after eating a taco, had a power failure in the middle of a SAVE or had one of a thousand things go wrong.

One sure way of preserving your work is to save your files **OFTEN!** However, even that sometimes does not save you from disaster. So, I will tell you how I avert disaster and the rest is up to you.

**GENERAL RULES**

1. Wash hands **BEFORE** handling diskettes. DO NOT use hand lotions **AFTER** washing your hands. I suppose that you could get away without washing your hands but one **SPECK** of oil or grease after accidentally touching the diskette's magnetic media will cause it to become **UNREADABLE** by the computer.

2. NEVER use paper clips on diskettes. These cause the diskette to become deformed and possibly dented. Paper clips that have been in magnetic clip-holders can also retain their magnetism and may cause "electrical damage" to the diskette.

3. Remove **ALL** magnetic gadgets from the word processing area. Magnetic paperclip holders, magnetic calendars, and magnetic paper holders. These little desktop decorations and office aids can cause **IRREPARABLE** damage to diskettes.

4. NEVER place diskettes near a telephone. Telephones have magnets and transformers in them.

5. NEVER place diskettes OR DISK DRIVES on the left side of a MODEL I computer (MODEL III is OK) as the video flyback transformer is on this side of the unit. This transformer radiates a strong high frequency magnetic field and will raise hell with your disk drive's electronic parts. It may also cause diskettes to become unreadable! (Cute, huh?)

6. Treat diskettes with respect. Diskettes are cheap. Data is expensive. Why jeopardize **EXPENSIVE** and **VALUABLE** data by trying to save a couple of bucks on diskettes?

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## BACKUP PROCEDURES

=====

"Backing up" a diskette is the best insurance you have for preserving data. If one diskette is lost, you will have the back-up copy to fall back on. Of course, any new material you have added since backing-up the disk will not be there but on important files this usually means that you will only have to retype the additions or changes.

Most people only make one back-up copy of their diskettes. In most cases this is OK but on important data this can lead to trouble. Let me illustrate the problem and then we'll talk about ways to avoid it.

Suppose you have this extremely valuable data (such as this manual) stored on diskette. If you were to lose the diskette you would lose a couple of months of work in one fell-swoop. So, to prevent that, you back-up the data every couple of days. In two years of working with the computer this has always been sufficient. You have never had any problems that couldn't be overcome by using the back-up copy of the diskette.

One dry and windy day, you are working on very nearly the last chapter of the manual and performing a SAVE. While the program is writing the file to the disk, you get up and fetch yourself a cup of coffee. As you walk to the kitchen (if you are at home) or to the coffee area in the office, you pick-up a static charge while walking across the carpeting. No big deal, you do it all the time. Halfway to the coffee pot, you remember that you left your coffee cup next to the computer and return to get it. You reach across the keyboard ... ZAP! There is a MINIATURE lightning strike as your hand brushes against the keyboard. The disk is still spinning. Oh well, nothing seemed to go wrong. In another couple of seconds you see the message, "FILE SAVED"

You abandon your plans for coffee and immediately inspect your file in memory. Scrolling through the text, you don't see anything wrong. Just to be sure, you clear the memory and try to RELOAD the file. The disk runs and runs and runs. Nothing. Finally, you get the message, "DOS ERROR CODE 04". You look in the TRS-DOS Disk Manual to discover that an error code "04" is a "parity error during read".

You try to LOAD the file a few more times and get the same error. Alright, the damn disk is flaky, you conclude and resign yourself to putting in the back-up diskette, reloading the file, and re-entering your additions and changes. The back-up diskette is inserted and the file loaded. So far, so good.

What you do not know is that had you CAREFULLY inspected your file in memory, when it was first "zapped", you would have noticed an occasional strange character here and there. Since these "strange" characters were scattered through the file here and there, they escaped your attention. What this means is that random bytes of memory were "zapped". It also means that unbeknownst to you, memory that you could not see was also "zapped".

"So what," you say. Here's what. Some of that memory was memory used by the operating system --- that invisible group of programs that make the computer "smart". It was that part of memory that caused the parity error on your diskette. What is worse, is that IT HAS NOT BEEN CORRECTED! It is still "zapped".

Continuing with our story --- by now you have once again added your changes to your file and once again, you **SAVE** it. In fact, you save it several times, while you are composing your additions and changes. After a while you finish. Its late and you decide to print out the file tomorrow.

The next day, you decide to back-up your files. The diskettes are inserted and the back-up command is initiated. After a few seconds you get another one of this mysterious messages, "FUNCTION TERMINATED - ERROR DURING READ". Now you are in trouble. The original back-up diskette was zapped yesterday and today your master copy will not back-up. What happened?

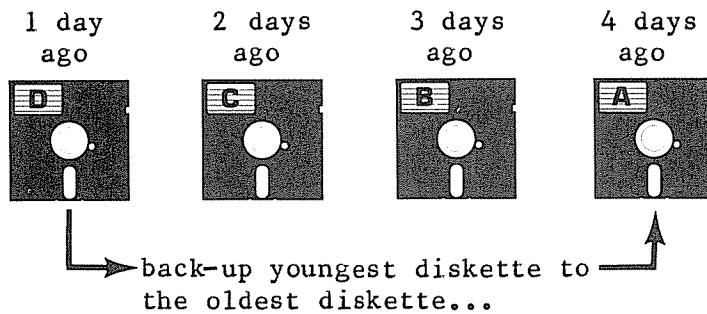
Its simple. After each save yesterday, the disk input/output software was making errors on the disk. That part of the software that computes the "parity" was zapped so that it computed a different parity than that normally used by the system. Today, when you "booted-up" your computer, the "zapped" disk routines were replaced with the correct routines. Now, the system is unable to read your diskette!

No amount of swearing and cursing is going to get it back. You can resort to the "extraordinary" methods mentioned above but you have probably avoided reading any of that "technical stuff". Now your master diskette is unreadable and so is your back-up copy!

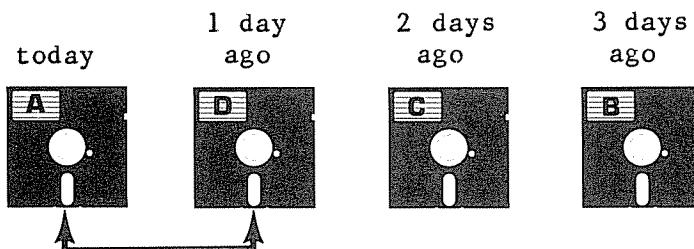
Here is how to avoid a story like the one above.

1. NEVER use a master diskette AFTER you have wiped out the back-up. Always **SAVE** to a standby diskette and transfer the file to the master later - AFTER you are sure that everything is OK.

2. Use this back-up method:



...and figuratively move each disk one place to the right. Now disk "A" is a duplicate of disk "D". Anything we put on disk "A" will not affect the work that we did "yesterday". Just to keep things straight relabel the diskettes A - D and repeat this procedure each time you start a new entry session.



These two diskettes are now duplicates - use "A" for "today's" entries.

If you will keep up this "round robin" method you will NEVER LOSE the entire diskette because you are always covered with back-ups that span several days. So, always back-up the "youngest" disk to the "oldest". Some of you will use three diskettes and some will use only two... whatever you choose, just remember that the more important the information is, the greater back-up depth you should use.

Another protection technique that I use is to always use two "scratch files" when I am working on a file. All of my SAVEs are to "SCRATCH1" and "SCRATCH2" while I am working. Then, when I am through for the day, I save the file to the correct file name. With this technique, even disastrous editing mistakes that I make myself are avoided.

The next dragon to rear its ugly head, is the destruction of diskettes as a result of a hardware problem. If you simply take your backup and stuff it into one of the drives, you will lose it. To prevent this, ALWAYS write protect your master diskettes when there is a problem. Then make a "temporary" back-up of the good disk and work on the "temporary" until you have resolved the problem.

If you are careful, you will always be covered and you should never have to resort to extraordinary measures to reclaim "lost" data.

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THE ELECTRIC PENCIL MESSAGES

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There are two types of messages: (1) error messages and (2) information messages.

Information messages inform you that some operation has been successfully completed, or there is a condition that you should be aware of, but is not an error. Error messages inform you of an error condition that has occurred while performing some specific operation.

The following messages are in alphabetical order.

BREAK - An information message issued when the <BREAK> key has been pressed during a tape or Stringy Floppy operation. Portions of any file loaded or saved, up until the time the <BREAK> key was pressed, will be in memory, on tape or Stringy Floppy.

CAN NOT LOCATE "xxxxxx" - Where 'xxxx' is a search string, from one to thirty-eight characters long, that could not be found during any SEARCH and REPLACE function. The screen is cleared and the message appears center screen. Press any key to return to TEXT ENTRY mode.

DISK DRIVE UNAVAILABLE - An attempt to SAVE, LOAD, KILL, or do a DIR to a specific disk drive which does not exist or to a drive that has an open door.

DISK FILE KILLED - An information message issued when a file has been successfully killed or removed from the diskette's directory.

DISK FILE LOADED - An information message issued when a file has been successfully loaded from the diskette.

DISK FILE NOT FOUND - A LOAD from diskette cannot be completed because the requested file cannot be found on the system. The message appears in the command line. Recover by inserting the diskette containing the file into an available disk drive and re-issuing the LOAD command.

DISK FILE SAVED - An information message issued when a file has been successfully saved to the diskette.

DISK FULL - An attempt to SAVE a file to a diskette that has no more room in which to store a program. CAUTION: Since part of the file may have been saved it is advisable to KILL that file and save it to a diskette with sufficient room.

DOS ERROR nn - An information message issued when a DOS error has occurred. 'nn' is the error code of the error. See TRS-DOS Disk Manual for error codes and their meanings.

ESF DRIVE NOT AVAILABLE - An information message issued indicating that the requested Stringy Floppy Drive is not on line.

FILE AREA FULL (TEXT MODE) - All available memory has been used. The screen is cleared and the message appears center screen. Press any key to return to TEXT ENTRY mode. Recover by deleting text or saving the file and starting a new file.

FILE AREA FULL (SYSTEM MENU MODE) - All available memory has been used as a result of a file, from tape, stringy floppy, or disk, filling or exceeding the buffer size. Press any key to return to TEXT ENTRY mode. Recover by deleting text or saving the file and starting a new file.

FILE SAVED WITHOUT PRINT VALUES - An informational message issued after a save to tape, stringy floppy or disk when the print values are off (PVOFF). The message appears above the "copyright" line.

LOCATED "xxxx" nnn TIMES - Where 'xxxx' is a search string and 'nnn' is the number of times the search string was located during a SEARCH only function. The screen is cleared and the message appears center screen. Press any key to return to TEXT ENTRY mode.

MARKER ERROR - There are too few or too many BLOCK MARKERS or there is no text between markers, in the text file, when a block move is attempted. The screen is cleared and the message appears center screen. Press any key to return to TEXT ENTRY mode.

MEMORY FAULT - An information message as a result of an error in memory detected by the operating system (DOS error code 35). This is usually as a result of a transient electrical problem or unstable memory.

NO DRIVER IN HIGHMEM - An information message issued when the command, "PSAVE filename:d" is used, indicating that the print driver has not been properly initialized.

NO FILE EXISTS - This message is issued under two circumstances and appears in the COMMAND LINE of the SYSTEM MENU:

1. When an attempt is made to LOAD a "null file" from disk. This is a file that has a file name but has no contents (physical records = zero). The message appears in the COMMAND LINE of the SYSTEM MENU.

2. When an attempt is made to save a file to tape, Stringy Floppy or disk and the cursor is at the end of the file or there is in fact, no text file.

OVERLAY FILE PENCILnn/SYS NOT FOUND - Where 'nn' is the number of an Electric Pencil system overlay. (01 - 02 - 03 - etc.). Message is issued when Electric Pencil cannot find its system overlay on the system. The screen is cleared and the message appears center screen. Press any key to return to TEXT ENTRY mode.

OVERLAY FILE PENCILnn/SYS NOT LOADED DOS ERROR nn - Same as above except that a DOS error may have been the cause of the Electric Pencil system file not found condition.

PENCIL04/SYS SETUP FILE SAVED - An information message issued when the command, "SETUP" is used, indicating that the SETUP file (PENCIL04/SYS) has been successfully transferred from memory to diskette.

PRESS ENTER TO DELETE 1 CHARACTER AT END OF FILE & DISPLAY TEXT - An unusual condition due to lines of full screen width, without spaces, that do not have carriage returns at the end of the lines and the text buffer is full. (FILE AREA FULL condition). The screen is cleared and the message appears center screen. Press any key to return to TEXT ENTRY mode. One character will be deleted from the text and the line will then be displayed. This may happen multiple times.

Recover by putting carriage returns at the ends of the long lines; by inserting spaces in the long lines or by reducing the amount of text in the file.

PRINT DRIVER CANNOT BE LOADED WITH TEXT IN FILE SAVE & CLR FIRST - An information message advising you that you must save your current text file, in memory, then clear memory, with the CLR or CAA command, before a print driver can be loaded. This is necessary because the print driver may require additional memory space currently occupied by your text file.

PRINT DRIVER LOADED - An information message issued when the command, "PLOAD filename:d" is used, indicating that the print driver has been successfully loaded from diskette.

PRINT DRIVER SAVED - An information message issued when the command, "PSAVE filename:d" is used, indicating that the print driver has been successfully transferred from memory to diskette.

PRINT REQUEST TERMINATED - LINE BELOW EXCEEDS PRINT LENGTH - A line of text cannot be printed because there are insufficient spaces within the line to permit the print routines to shift the word to the next line. The screen is cleared and the message appears center screen. Press any key to return to TEXT ENTRY mode.

Recover by inserting spaces into the line or by making the line length setting (LL) longer.

PRINT VALUES WILL BE USED - An information message issued when the command, "PVON" (Print Values ON) is entered in the SYSTEM MENU mode. The message appears in the COMMAND LINE of the SYSTEM MENU.

PRINT VALUES WILL NOT BE USED - An information message issued when the command, "PVOFF" (Print Values OFF) is entered in the SYSTEM MENU mode. The message appears in the COMMAND LINE of the SYSTEM MENU.

PROTECTED DISK FILE - This message is issued under two conditions and appears in the COMMAND LINE of the SYSTEM MENU.

1. A LOAD from diskette cannot be completed because the requested file is password protected. The message appears in the command line. Recover by issuing the LOAD command with the file name and password.

2. A LOAD from diskette cannot be completed because the requested file has a sector in which the sector ID marker has been changed to "protected status". This is an error caused by the operating system, the hardware or both. The message appears in the command line. Recovery may be attempted by using a disk utility program, such as SUPERZAP. (Also see TRS-80 DISK & Other Mysteries by H.C. Pennington, IJG \$22.50 - available at most book stores and computer dealers.)

REPLACED "xxxx" nnn TIMES - Where 'xxxx' is a search string and 'nnn' is the number of times the search string was located and replaced during a SEARCH and REPLACE function when 'nnn' is a number lower than the requested number of replacements. The screen is cleared and the message appears center screen. Press any key to return to TEXT ENTRY mode.

STRINGY FLOPPY FILE ERASED nnnnn BYTES - An information message issued after an @NEW operation, where 'nnnnn' indicates the number of bytes, on that Stringy Floppy wafer, available for storage.

STRINGY FLOPPY FILE LOADED - An information message issued when a file has been successfully loaded from the Stringy Floppy wafer.

STRINGY FLOPPY FILE SAVED - An information message issued when a file has been successfully saved to the Stringy Floppy.

STRINGY FLOPPY NOT AVAILABLE - An information message issued when a Stringy Floppy operation is requested and there is no Stringy Floppy drive attached to the system.

SYNTAX ERROR - Appears in the PRINT MENU and SYSTEM MENU when a command has been entered incorrectly.

TAPE ERROR - The system has detected a checksum error during a tape loading operation. Any text loaded, previous to the error condition, will be in memory.

TAPE FILE LOADED - An information message issued when a file has been successfully loaded from the cassette tape.

TAPE FILE SAVED - An information message issued when a file has been successfully saved to the cassette tape.

TAPE FILE VERIFIED - An information message issued when a file has been successfully verified.

TAPE TOO SHORT - An information message issued during an @SAVE operation, when a file will not fit onto a Stringy Floppy wafer. Recover by using a Stringy Floppy wafer of greater length, to save your file on.

TEXT IN MEMORY CANNOT BE RECOVERED PRESS ENTER TO CONTINUE - Message is issued when a re-start of the ELECTRIC PENCIL was attempted with the command, "PENCIL \*", from DOS, but the text file has been altered in memory and is not recoverable.

Press ENTER and a normal entry to ELECTRIC PENCIL will be made.

WARNING: CURSOR NOT AT BEGINNING OF FILE ONLY PART OF FILE SAVED - A warning message issued from the SYSTEM MENU that appears in the "copyright" line.

WRITE PROTECTED DISK - A SAVE to disk cannot be completed because the diskette has a write protect tab over the notch. The message appears in the COMMAND LINE of the SYSTEM MENU. Recover by removing the write protect tab and saving the file.

## APPENDIX I

=====  
GLOSSARY  
=====

Words that may be new to you are included in this glossary. Commonly used words that may have a special meaning in the context of word processing are also included. We have also included words that are peculiar to the operation of a computer in general. Since you may see reference to them in other manuals, publications and in discussions concerning the computer or THE ELECTRIC PENCIL word processing system.

ABORT - To cease or halt an operation without processing any more data.

ACCESS - The operation of seeking, reading or writing data on a storage unit such as the disk or tape drive.

ACCESS TIME - The time that elapses between any instruction being given to access some data and that data becoming available for use.

ACRONYM - A word formed by combining initial letters or syllables and letters of a series of words for a compound term. CIA is the acronym for "Central Intelligence Agency".

ADDRESS - An identification (number, name or label) for a location in which data is stored.

ALPHANUMERIC (CHARACTERS) - A generic term for numeric digits, alphabetic characters, punctuation characters and special characters.

ASCII - Acronym for "American Standard Code for Information Interchange". Pronounced: Ass-KEY. Usually refers to a standard method of encoding letter, numerical, symbol and special function characters, as used by the computer industry.

ASSEMBLY LANGUAGE - A machine level language for programming.

BAUD - A technical term to express the rate at which data may be transferred between computer devices. Generally speaking 300 baud means that data is being transferred at the rate of 300 bits per second. Even more generally it means 30 characters per second although this is technically not quite correct.

BASE - A quantity of characters for use in each of the digital positions of a numbering system.

BILLBOARD - A message displayed at the beginning of a program showing the name of the program, its author and any other information the seller may feel is fitting or necessary.

BINARY - A numbering system consisting of two symbols (0,1), representing a sum in which the individual quantity represented by each symbol is based on a multiple of 2.

BIT - A single "BINARY" digit whose value is "zero" or "one".

BLANK LINE - A line whose first character is a carriage return.

BLOCK - Any amount of text as small as one character or as large as an entire file. A block may be a word, a sentence or a paragraph or a group of paragraphs.

BOOT - BOOTSTRAP - On the TRS-80, a machine language program that is on every diskette. This program is loaded and executed when the machine is reset or turned on. It in turn automatically loads the necessary programs to cause the computer to respond to the DOS commands; i.e., the machine is "BOOTSTRAPPED" or "BOOTTED" into operation.

BREAK - See ABORT above.

BUFFER - An area of memory used for the temporary storage of data.

BUG - A software fault that results in the malfunction of a program. May also refer to hardware malfunctions.

BYTE - Eight "bits". A byte may represent any numerical value between '0' and '255' (decimal).

CARRIAGE RETURN - A term that is the equivalent to "RETURN" or "ENTER". Originally, computer printers operated much like a typewriter whose carriage moved from side to side. In order to cause a new line to be printed, the carriage had to be returned to its home position and the paper advanced one line. Although computer printers do not for the most part operate in this way anymore, the term is still used and means to begin printing at the home position and may or may not, depending on the printer or software, also include a line feed. On the video screen a carriage return also means to start a new line.

CHARACTER - Any letter, number, punctuation or symbol appearing on the video display screen or keyboard.

CHECKSUM - A method of verifying that data has been correctly read or written in which groups of digits are summed or added, and that sum is checked against a previously computed sum to verify that no digits have been changed since the last summation.

CLEAR - The action of erasing or wiping out or deleting text from the face of the video display screen or from the FILE AREA.

CLOBBERED - A slang term referring to the non-operation of software, hardware, computer device, or storage media (such as disk or tape); usually as the result of a program or hardware error.

COMMAND - A control character, word, or normal letter character that is used to tell THE ELECTRIC PENCIL what to do.

COMMAND FILE - A file consisting of a list of commands to be executed in sequence - a machine language "object" file - usually command files have the filename extension, "/CMD". THE ELECTRIC PENCIL is such a command file (PENCIL/CMD).

COMMAND STRUCTURE - The language or key sequences by which a command is formed enabling the computer operator to communicate with the machine and/or software.

CONTROL - A keyboard key that is used together with any letter key to create a control character. Unmodified TRS-80's (uppercase only) use the clear key to create control characters. When the TRS-80 is modified for lowercase entry and display, a separate control key may be added as part of the lowercase modification kit.

CONTROL CHARACTER - A nonprinting ASCII character used to tell THE ELECTRIC PENCIL what to do.

CRC ERROR - "Cyclic Redundancy Check" - a means of checking for errors by using redundant information. Used primarily to check disk input and output.

CURSOR - A transparent white block which appears on the video display screen and is used to indicate the character or space about to be typed, moved, inserted or deleted.

DCB - An acronym for "Device Control Block". A DCB is a section of memory in which the operating system stores information necessary to control other devices such as the printer, tape, and disk drives.

DEFAULT VALUE - A value assumed by a program whenever no value is specified by the operator.

DELETE - The process of removing a character, a space, a line or a block of text from the video display screen.

DIRECT ACCESS - Retrieval or storage of data by reference to its location on a disk, rather than relative to the previously retrieved or stored data.

DIRECTORY - A table giving the relationships between items of data. Sometimes a table or an index giving the address of data. On the TRS-80 an index of programs and files stored on a diskette.

DISTRIBUTION DISKETTE - The diskette on which programs are distributed. Also see MASTER DISKETTE below.

DOS - Acronym for "Disk Operating System". A software program that manages the task of reading and writing disk files. It is usually transparent to the operator.

DROP-OUT - The accidental failure to read or write a necessary character.

DUMP - To transfer all or part of the contents of one section of computer memory, disk or tape into another section or to some other computer device.

EJECT - A term referring to the action of a printer when feeding a page of paper. Also see FORM FEED below.

EOF - Acronym for "End Of File".

FILE - A collection of related records, or characters treated as a unit. The word "file" is used in the general sense to mean any collection of informational items similar to one another in purpose, form and content. A file may be stored in memory, disk, tape or any other storage medium.

A text file is the entirety of text that has been entered onto the video display screen and subsequently into the memory of THE ELECTRIC PENCIL. All the text resident within the system at any given time is called a file.

FILE AREA - The area in memory that has been reserved for the file. When THE ELECTRIC PENCIL is first turned on, this area is automatically determined by the system by examining all available contiguous (adjoining) memory and claiming it. Whenever the file area is full, the message "FILE AREA FULL" will appear on the screen.

FILE NAME - The name of a particular file as stored.

FILE PARAMETERS - The data that describes or defines the structure of the file.

FILE SPECIFICATION - FILE SPEC - The name and location of a particular file as stored.

FLAKY - A slang term that alludes to less than acceptable performance.

FORCE - To cause an action to take place before it is scheduled to happen.

FORM FEED - A character entered into the file that will cause the printer to advance to the top of the next page. The character on the screen is the down arrow on the Model I or diamond character on the Model III.

FORMAT - A specified arrangement of data or text for a desired clear presentation.

FORMATTED DISKETTE - A diskette which has been prepared to receive data. It is considered "blank" but in reality it has been pre-recorded and certain necessary files put onto the diskette such as the directory and boot program.

GAT - Acronym for "Granule Allocation Table"; A table from which available file areas are assigned to disk files. The GAT table is located in the diskette DIRECTORY FILE. See Granule Below.

GRANULE - On the TRS-80 a "granule" is the basic unit of disk storage allocation. The number of sectors in a granule varies with the various operating systems and machines. The diskette directory file keeps track of free and assigned disk space in terms of "granules". See "GAT" above.

HASH CODE - A code number generated and used as a direct addressing technique in which a key word is converted to a number from which the required address is derived. See "HIT" below.

HEADER - A record or group of characters containing common, constant or identifying information for a group of records which follow.

HIGH MEMORY - A term referring to the highest possible memory address that is accessible to the system. This address may be set to exclude memory which the program or operator wishes to use for special purposes.

HIT - Acronym for "Hash Index Table". The HIT table is located in the diskette's DIRECTORY FILE. See "HASH CODE" above.

HEXADECIMAL - A numbering system consisting of sixteen symbols (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F) representing a sum in which the individual quantity represented by each symbol is based on a multiple of 16. The hexadecimal numbering system is especially convenient in computers because of the ease in translating binary information.

INDEX - A table used to determine the location of a record or file.

IPL - Acronym for "Initial Program Loader". A program usually executed upon pressing the reset button.

JUSTIFICATION - The process of adjusting spaces within a line of text in order to create an even right-hand margin.

KEY - (1) A button on the keyboard which when pressed, causes a character to be displayed on the video screen. (2) A special word, letter or phrase by which something is obtained.

LABEL - A set of symbols or characters used to identify or describe an item, record, message or file. Occasionally it may be the same as the address in storage.

LIST - An ordered set of data items.

LOAD MODULE - A program developed for loading into storage and being executed when control is passed to the program.

LOCK-OUT - Usually refers to tracks on a diskette that are not accessible because of damage or by user option.

LOGICAL - An adjective describing the form of data organization, hardware or system that is perceived by an application program, programmer, or user; it may be different than the real or physical form.

LINE FEED - A character in the file that will terminate a line and cause a new line to begin. The character on the screen is a left arrow and is typed into the file using the ENTER key.

MAINTENANCE OF A FILE - (1) The addition, deletion, changing or updating of records in file. (2) Periodic reorganization of a file to better accommodate items that have been added.

MACHINE CODE - A code consisting of binary numbers which upon machine recognition, causes a predefined sequence of operations to occur.

MACHINE LANGUAGE - A language consisting of mnemonics and numbers which can be assembled into machine code which the computer can then execute. See MACHINE CODE above. Also see ASSEMBLY LANGUAGE above.

MASTER DISKETTE - A diskette used only for the purpose of making copies of the programs contained on that diskette.

MNEMONIC - (Pronounced: nee-mon-ick) A memory aid. Computer commands which have been shortened from their English words are referred to as a mnemonic. "DIR" is the mnemonic for "directory".

MODE - A method of operation.

NULL - An absence of information as contrasted with zero or blank for the presence of information. A null is the ASCII code  $\emptyset\emptyset$  whereas the ASCII code for the character zero ( $\emptyset$ ) is 48.

NYBBLE - The four right most or left most binary digits of a byte.

ON-LINE - An on-line system is one in which the input data enters the computer directly from their point of origin, and/or output data are transmitted directly to where they are used. The intermediate stages such as writing tape, loading diskettes or printing are avoided.

ON-LINE STORAGE - Storage devices and especially the storage media which they contain, under the direct control of a computing system and available at any time for the storage and retrieval of data.

OPERATING SYSTEM - Software which enables a computer to supervise its own operations, automatically calling in programs, routines, and data as needed for continuous operation.

PARITY - Parity relates to the maintenance of a sameness of level or count, i.e., keeping the same number of binary ones in a computer word and thus be able to perform a check based on an even or odd number for all words under examination.

PAGE - Sixteen lines of text appearing on the video display screen. May be any number of lines of text when referring to a printed PAGE. PAGE may also refer to a number of bytes in memory; usually 256 bytes.

PAGINATION - The process of automatically numbering pages.

PRINT DRIVER - A software program which causes the line printer to function with the computer.

PHYSICAL - An adjective, contrasted with logical, which refers to the form in which data or systems exist in reality. Data is often converted by software from the form in which it is physically stored to a form in which a user or programmer perceives it.

POINTER - The address or a record (or any other data groupings) contained in another record so that a program may access the former record when it has retrieved the latter record. The address can be absolute, relative or symbolic, hence, the pointer is referred to as absolute, relative or symbolic.

PRINTER - An electric or electronic typewriter like device that prints text from THE ELECTRIC PENCIL file area onto paper.

PRINT VALUE - A value assigned to a printing function by the user or by the system. This value will determine Line Length, Page Length, Line Spacing, etc.

RAM - Acronym for "Random Access Memory". See RANDOM ACCESS below.

RANDOM ACCESS - A storage technique in which the time required to obtain information is independent of the location of the information most recently obtained.

ROM - Acronym for "Read Only Memory". This type of memory has data permanently stored in it and can only be read. It may not be altered in any way.

READ - The action of moving a file from a storage medium, such as tape or disk, and inserting it into the file area (loading a tape into the computer).

RECORD - (1) As applies to THE ELECTRIC PENCIL program; any block of text that is terminated by an ENTER (ENTER key) or a FORM FEED. A record may be as short as one character or as long as the entire file. A record is most nearly like a paragraph. (2) A group of related data items treated as a unit by an application program.

SEARCH - To examine a series of items for any that have a desired property or properties.

SECTOR - A discrete area of storage on a diskette. 256 bytes on the TRS-80

SCROLL - The action of the text moving up or down the video display screen. More than 16 lines of text (one page) must exist in the file for this action to occur.

SOURCE CODE - The symbolic text from which machine code that may be executed, is generated.

STRING - Any consecutive grouping of letters, spaces, numbers, punctuation or symbols. In this system, a string may be anywhere from 1 to 40 characters long.

SYSTEM FILE - A program used by the operating system to manage the executing program and/or the computer's resources.

TABLE - A collection or list of data suitable for quick reference; each item being uniquely identified either by a label or it's relative position.

TEXT - Any collection of characters, and words that can be read by. Text may or may not be machine readable but generally speaking, a "text file" is a literary effort.

TOGGLE - A term meaning to switch on and off with the same instruction. If a device is ON then the next time the instruction which turned it on is issued, it will be turned off and vice-versa.

TRANSPARENT - Complexities that are hidden from the user by the software.

VERIFY - To check a data transfer or transcription

VIDEO DISPLAY SCREEN - The electronic display unit of the TRS-80. Also called a CRT (Cathode Ray Tube), VDT (Video Display Terminal), monitor or simply, screen.

WORD - Any number of characters with at least one space at either end. A WORD may be as short as one CHARACTER or as long as one line.

WORKING DISK - A diskette containing the programs used for day to day operations.

WRAP AROUND - On the computer this term refers to the presentation of characters on the video screen and means to continue a line of characters, when the right most edge of the display is reached, on the next line.

WRITE - The action of moving text from the file area and recording it onto disk, cassette tape or other storage medium ("recording" a tape from the computer).

ZAP - A slang term meaning to change something in memory or on a storage device such as a diskette. It may also refer to something which was accidentally changed.

## APPENDIX II

## =====

## USING A SPECIAL PRINT DRIVER

## =====

There are three print drivers built into THE ELECTRIC PENCIL. They are: (1) A "standard" parallel print driver that outputs to the TRS-80 expansion interface parallel printer port. (2) The Small Systems Software TRS-232 serial print driver that outputs to the cassette port and (3) a serial print driver that outputs to the UART (RS232c) port. (Also see PLOAD and PSAVE above.)

With this release of THE ELECTRIC PENCIL, custom print drivers may also be used without having to "patch" them into the system. The following procedure will allow you to use ANY print driver with THE ELECTRIC PENCIL.

There are three ways to load a custom print driver. Method one permits you to load and initialize the print driver prior to loading and running THE ELECTRIC PENCIL. If yours is a tape or EXATRON STRINGY FLOPPY system you will have to use this method.

Method two allows you to load your print driver from within THE ELECTRIC PENCIL program itself and method three allows you to load it automatically when you load and run THE ELECTRIC PENCIL. Methods two and three are for disk systems only.

Method three requires that the print driver be a LOAD MODULE, which you may create with the "PSAVE" command from THE ELECTRIC PENCIL'S SYSTEM MENU.

**SPECIAL NOTE:** There are two high memory address pointers. One for BASIC and one for the DOS. The ELECTRIC PENCIL uses both high memory addresses. Be sure to set at least one of the high memory addresses when initializing your print driver.

LOADING THE PRINT DRIVER - Method one. (All systems)

1. (a) NON DISK SYSTEMS - Set MEMORY as you would for the print driver you normally use.

(b) DISK SYSTEMS - From "DOS READY" load BASIC and set MEMORY as you would for the print driver you normally use.

2. With memory set, load your print driver and initialize the printer DCB with the print driver's entry address.

3. (a) NON DISK SYSTEMS - Go to step 4, below.

(b) DISK SYSTEMS - Return to "DOS" with the command: CMD"S"

4. Load and run THE ELECTRIC PENCIL. The print driver you have loaded will now function.

5. DISK SYSTEMS ONLY - If you have a print driver that will do all of the above automatically from DOS, then go to method 2 or 3, below.

LOADING A PRINT DRIVER - Method two (Disk systems only)

Once a "load module" has been created (see below) it may be loaded from THE ELECTRIC PENCIL'S SYSTEM MENU. Assuming you have already created the load module as described below, load and execute THE ELECTRIC PENCIL. Go to the SYSTEM MENU and type the following:

PLOAD filespec<ENTER>

The print driver will load, set high memory and initialize the printer DCB. You may PLOAD a print driver at any time.

LOADING A PRINT DRIVER - Method three (Disk systems only)

Assuming you have created the print driver load module (see below) you may load and initialize the print driver automatically each time you load and run THE ELECTRIC PENCIL just as if your print driver were part of THE ELECTRIC PENCIL. Using method two, above, get your print driver loaded and initialized then go to the SYSTEM MENU and type:

SETUP <ENTER>

THE ELECTRIC PENCIL will create a setup file called "PENCIL04/SYS". Your print driver will now be automatically loaded and initialized whenever you load and run THE ELECTRIC PENCIL (also see SETUP, above).

SAVING YOUR PRINT DRIVER AS A "LOAD MODULE" (Disk systems only)

NOTE: It is not possible to create a load module with tape or Stringy Floppy versions - all print drivers will have to be loaded and initialized as in method one, above.

Once the print driver has been loaded and initialized, it may be saved with an added program appendage that will, in the future, automatically set HIGH MEMORY and initialize the printer DCB. Once this "load module" has been created, it may be used at any time, by ANY PROGRAM.

1. After you have taken the steps outlined in method one, above, load and run THE ELECTRIC PENCIL. Go to the SYSTEM MENU.

2. From the SYSTEM MENU, type the following:

PSAVE filespec<ENTER>

NOTE: The "filespec" is the name you wish to give to your print driver and may include an extension and drive specification.

3. Your print driver will be saved to disk with the file name you have given it and may now be loaded using Method two and three above.

NOTE: THE ELECTRIC PENCIL will save the print driver from the current HIGH MEMORY address, to the end of memory.

APPENDIX III

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CUSTOMER SERVICE

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When you are having trouble, it is sometimes impossible to tell whether the trouble is hardware, software, or even if comes from an outside source such as the power company. With a device as complex as the computer it is amazing (a miracle?) that it works at all. Your 48K RAM machine has a total memory capacity of 64K (12K ROM + 48K RAM) and each of those 64 thousand bytes is made up of eight bits. That's over half a million bits! This in itself is remarkable but what is more remarkable is that each one of those bits needs to be "recharged" every few micro-seconds; the CPU has to manage its tasks at over 1 million instructions per second AND IF ONE LOUSY BIT IS BAD, THE WHOLE THING CAN STOP WORKING!

A comprehensive guide to hardware/software trouble shooting would be a large book in itself. Additional complications such as operating systems, diskettes, drives, interfaces and printers compound the complexity of the problem. THE ELECTRIC PENCIL was designed to run on standard Radio Shack computer systems. We have tried to take into account the various Radio Shack changes and alterations, the "usual" custom modifications that you might have made yourself and the various incompatibilities between the MODEL I and MODEL III machines.

When you have trouble and before going into "panic mode", check the following items:

1. Make sure that all cable connections are correct and that all edge card solder plated connectors are CLEAN!.

2. That the system software is functioning correctly. If in doubt, power up from a "cold" start (everything off) and verify the systems operation with other programs that you know to be operating correctly.

3. Verify that the system information, on the diskette, (usually the directory) is correct. If you have NEWDOS, or NEWDOS/80, use DIRCHECK to verify that system directory information is correct. If you are using another system, praying may make you feel better but we have no verification that it has corrected any problems.

4. Make sure that your peripheral devices (printers, disk drives, etc.) are properly attached, and in working order.

5. When files mysteriously "disappear" from directories or when you are suddenly unable to load and save to particular diskettes look for the trouble to be related to the operating system (in most cases) and secondarily related to hardware problems with disk controllers or disk drives. Files do not just "disappear". (See TRS-80 DISK & Other Mysteries.)

If you cannot find any rational, reasonable or electro-mechanical cause for your problem then follow the procedure below:

1. Reread your documentation - make sure you understand how to make your system work.
2. Make sure that all other programs that you may be interfacing or using with THE ELECTRIC PENCIL are working correctly.
3. Make sure that your operating system is up to date and that you are using the latest "zaps" and "patches" for that system.
4. Try to duplicate your error so that you can describe, IN WRITING, exactly, the nature of your problem.
5. Using the form provided in this appendix, describe the Problem, the circumstances under which you encountered the problem, and what happens when the problem occurs. Fill out the form COMPLETELY.
6. Make a copy of your system diskette AND your data diskette, if possible. Mail the form and the diskettes to:

IJG, Inc.  
1260 West Foothill Blvd.  
Upland, California 91786

IJG will, as soon as possible, attempt to determine if the cause of the problem is with THE ELECTRIC PENCIL program. In the event that it is, and not due to the interfacing of other software or due to hardware problems, IJG will notify you, by return mail, of any fixes, zaps or patches that may correct the problem.

However, if your problem is unique to your use, application, situation or hardware configuration, IJG will not attempt to define your particular problem. (Many times the software is used in ways which the designers and writers did not contemplate.) You will be notified, by return mail, of any conclusions that IJG may make regarding your problem.

All problem inquiries will be handled by mail only.

NOTICE

DISKETTES WILL NOT BE RETURNED UNLESS ACCOMPANIED BY AN ADDITIONAL SHIPPING & HANDLING FEE OF \$2.50.

In the event that you have damaged your original program diskettes, return the damaged original program materials along with the fees listed below:

Diskette: \$12.50  
Cassette: 10.00  
ESF wafer: 10.00  
Shipping & handling: 2.50

Additional copies of the documentation will be supplied at \$24.95. (Calif. residents add 6% SALES tax) + 2.50 shipping and handling.

Mail all materials, requests and Service Difficulty Reports to the address noted above.

## SERVICE DIFFICULTY REPORT - SDR Number 1PR/

SOFTWARE PACKAGE:

DATE:

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_ PHONE: \_\_\_\_\_

Source or Micronet ID: \_\_\_\_\_ DISKETTES ENCLOSED: (Y) (N)

TRS-80 MODEL I ( ) MODEL III ( ) TAPE ( ) STRINGY FLOPPY ( ) DISK ( )

MEMORY: ( )48K ( )32K ( )16K UPPER/LOWER CASE (Type): \_\_\_\_\_

Expansion interface if other than Radio Shack: \_\_\_\_\_

Operating System: \_\_\_\_\_ Version: \_\_\_\_\_

Zaps or patches thru (Date or ZAP no.): \_\_\_\_\_

Disk drive units (Mfg.): \_\_\_\_\_ Model: \_\_\_\_\_ No.: \_\_\_\_\_

Printer (Mfg.): \_\_\_\_\_ Model: \_\_\_\_\_ Type: \_\_\_\_\_

Additional Hardware Modifications (List mfg. &amp; model): \_\_\_\_\_

I have had my computer system approximately \_\_\_\_\_ years, \_\_\_\_\_ months. I have had my disk system \_\_\_\_\_ years, \_\_\_\_\_ months.

Description of problem:

Circumstances under which it occurred:

I.J.G. OFFICE USE

Recommendation:

By:

Date:

Action:

By:

Date:

?:

EP ( ) Sys Swr ( ) Dsk Drv ( ) Pnt ( ) Pnt I/F ( ) Pnt Dvr ( )  
I/F ( ) Dsk ( ) CPU ( ) Mem ( ) UNK ( ) LOG: SF:



## APPENDIX IV

=====  
FUTURE ELECTRIC PENCIL PRODUCTS  
=====

There are many applications and utility applications for a word processor, such as THE ELECTRIC PENCIL. The following are planned future program releases and publications that will use or enhance THE ELECTRIC PENCIL word processing system.

THE ELECTRIC PENCIL HANDBOOK - An extensive guide to THE ELECTRIC PENCIL documenting the internal program operation, the exact locations of the various routines, constants, variables and tables. The program's source code (for disk only), with symbolic labels, and comments are included in this book - a must for machine language programmers, developers and hobbyists who wish to modify THE ELECTRIC PENCIL for special applications. \$29.95

BLUE PENCIL - A text proofing addition to THE ELECTRIC PENCIL. BLUE PENCIL reads the text file and notes any spelling errors on the video or printer. It recognizes prefixes, suffixes, hyphenation and comments. The word dictionary is infinitely expandable - by you! You can add or delete your own vocabulary of words to BLUE PENCIL's dictionary.

BLUE PENCIL Comes with a 50,000 word dictionary (equivalent to a Webster's Pocket Dictionary.) Typical proofing time for a 6000 word text file is under two minutes. Requires 32K minimum, 1 disk drive.

RED PENCIL - A text correction addition to THE ELECTRIC PENCIL. RED PENCIL automatically CORRECTS errors detected by BLUE PENCIL. RED PENCIL displays each misspelling and typo separately and offers you a choice of options which include: retyping the misspelled word, leaving it as is, adding it to the dictionary or displaying the word in context. If you choose to display the word in context, then you are again offered the first three choices. The text is instantly corrected and you may then proceed with your word processing chores. Typical correcting time for a 6000 word file is under two minutes. (Note: time may vary depending on the number of spelling errors.) Requires 32K Minimum, 1 disk drive and BLUE PENCIL.

PENCIL-GRAM - A fully developed communications interface permitting the sending and receiving of data files, text files, and binary files via the RS232c interface. Text program and data files may be sent or received from the keyboard or buffer. Requires 32K, 1 disk drive, RS232c interface and modem.

TALKING PENCIL - A word processor for visually handicapped persons that incorporates all of the features of THE ELECTRIC PENCIL 2.0. Talking pencil will "pronounce" each letter as it is typed, each word, as it is completed and will "read" the text as well as print it. Commands and menu selections are announced as are all parameter settings. Requires 48K 2 disk drives, RS232c interface and voice synthesizer.

ELECTRIC-TYPE - A typesetting software interface that will permit THE ELECTRIC PENCIL to send text files to the Quadritek 1200 and the AutoLogic 600 automatic typesetting and composition machines. The software interface permits the embedding of typesetting codes and the translation of those codes when the text files are transmitted to the typesetter. Requires THE ELECTRIC PENCIL, 48K, 2 disk drives.

PENCIL TIP - A dynamic print formatting addition to THE ELECTRIC PENCIL. PENCIL TIP permits the use of embedded codes that will permit you to dynamically format your printed output. It also permits the embedding of printer codes to control a "smart" printer, subscripts, superscripts and many other features. "Chaining" of text files and insertion of data (names, addresses, etc) from other files will let you print personalized letters from within THE ELECTRIC PENCIL.

DRAWING PENCIL - A graphics addition to THE ELECTRIC PENCIL with which you can generate and print TRS-80 graphics characters in addition to the regular text characters.

PENCIL KIT - A set of utilities that add additional features to THE ELECTRIC PENCIL such as "table" input/output, that will permit you to define the keyboard characters and the output characters. A file formatting utility that permits the use of THE ELECTRIC PENCIL to create and load files that are compatible with BASIC (compressed binary), Editor Assembler, MAC-80, and other file types. A utility that permits the defining of keys for single keystroke input of words and phrases.

DRIVERS I - A set of print drivers for serial and parallel printers. Files are in object AND source form. They may be changed, modified or re-written to suit your own needs or they may be used as is. A special BASIC utility is provided that permits you to modify the object code without re-assembling. All drivers are written in relocatable code and even have a built in utility to "find themselves" no matter where they have been loaded in memory. These drivers have features such as BREAK even when you have accidentally issued a print command and the printer is NOT EVEN ATTACHED. These drivers may be used by any program and from DOS or BASIC.

Print drivers included are:

- NEC Parallel Bi-directional
- NEC Serial Bi-directional
- Diablo parallel bi-directional
- Diablo Serial bi-directional
- "Standard" Serial
- Teletype-33 20ma current loop driver.
- IMPROVED ROM driver (parallel)
- TRS232 driver
- BASIC "configuration" program

Requires TRS-80 Editor/Assembler tape or APPARAT disk assembler to assemble source code.

THE ELECTRIC PENCIL 2.0 OPERATING MANUAL - Additional copies of this manual may be obtained for \$24.95 from IJG, Inc., 1260 W. Foothill Blvd., Upland, California 91786

## APPENDIX V

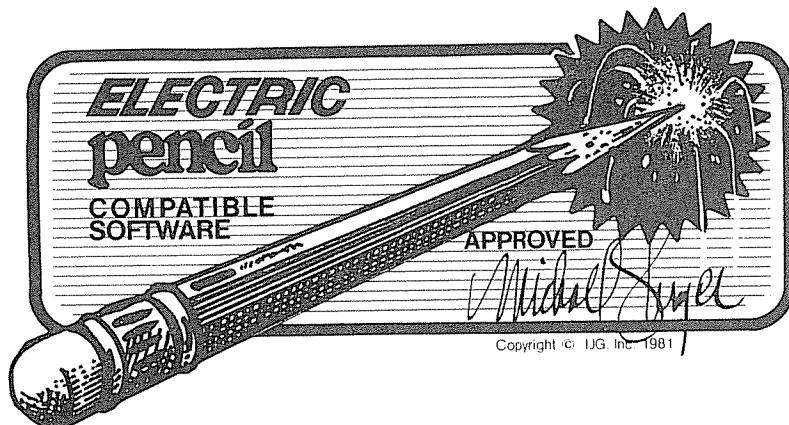
=====

OTHER PROGRAMS THAT WORK  
WITH THE ELECTRIC PENCIL

=====

Many programs are offered by other vendors that enhance or work with THE ELECTRIC PENCIL. These programs fill the special needs of many users. Some of these programs modify THE ELECTRIC PENCIL itself and others use the files created by THE ELECTRIC PENCIL. Beginning with this release of THE ELECTRIC PENCIL, independent programmers may obtain an endorsement, for their product, that will assure you that their addition works with THE ELECTRIC PENCIL.

An "APPROVED ELECTRIC PENCIL COMPATIBLE PROGRAM" will carry this seal of approval:



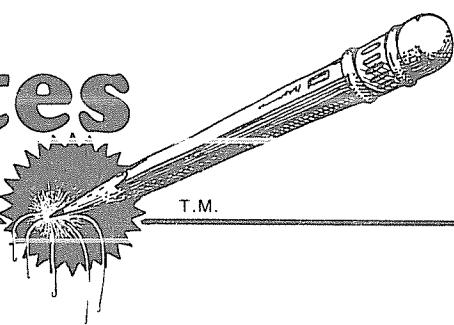
This seal is your guarantee that this is a truly compatible product. That it has been tested and it performs as advertised with THE ELECTRIC PENCIL.

If you have a program or enhancement that works with THE ELECTRIC PENCIL, and wish to have your product carry this seal, contact:

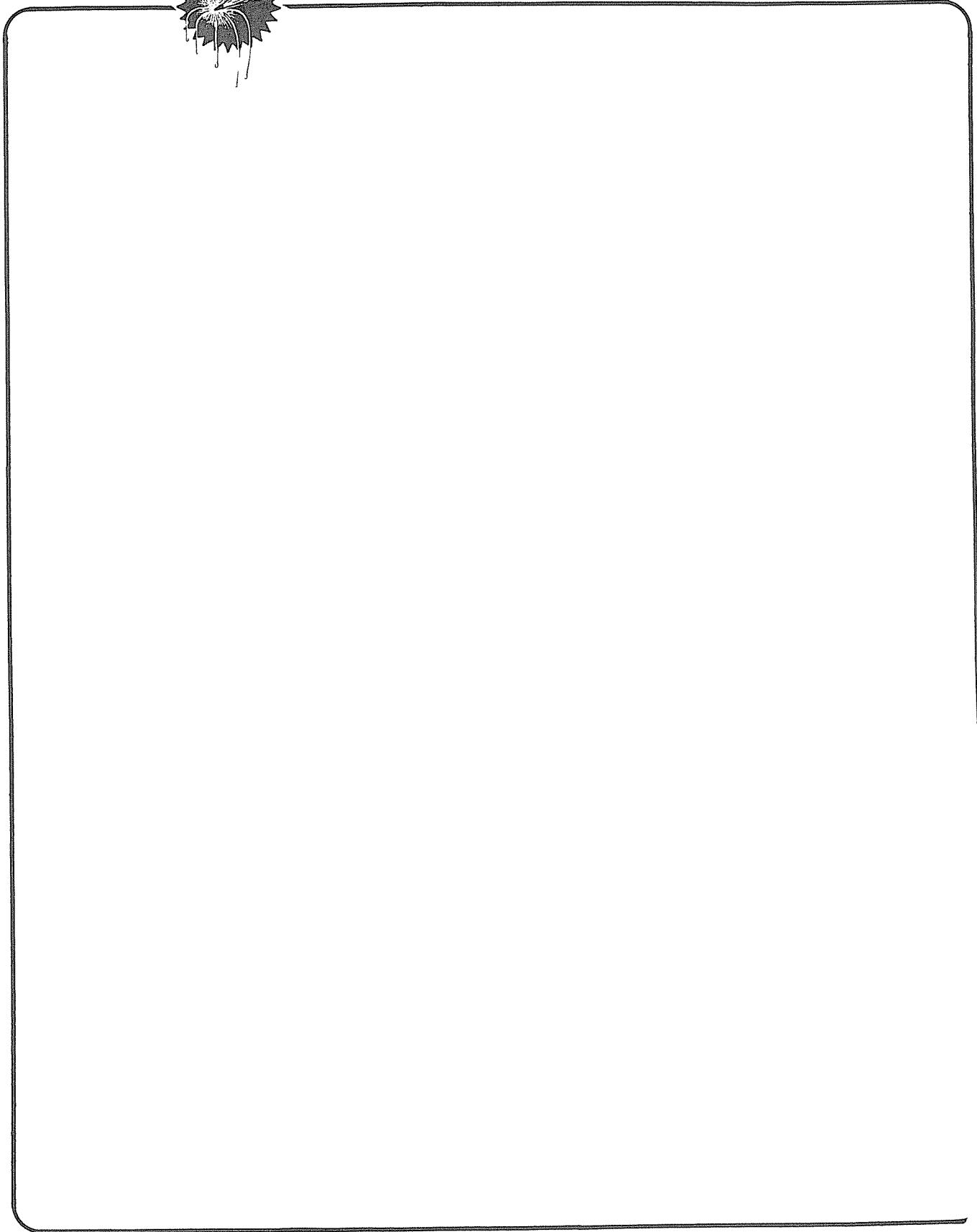
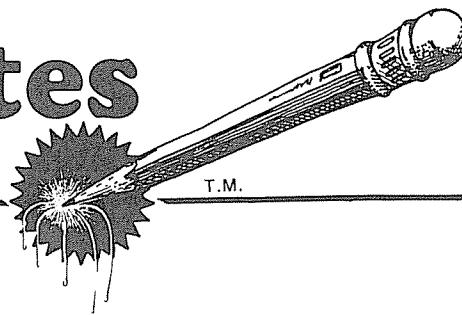
IJG, Inc.  
Marketing Dept.  
1260 West Foothill Blvd.  
Upland, California 91786

As an additional help in developing THE ELECTRIC PENCIL compatible programs, you may obtain commented source code for THE ELECTRIC PENCIL Version 2.0 in "THE ELECTRIC PENCIL HANDBOOK". This book is scheduled for release in mid 1982 and will be available from IJG or your IJG dealer for \$29.95. It is a reference guide to assist you in modifying, adding, and enhancing THE ELECTRIC PENCIL programs. (See APPENDIX IV above.)

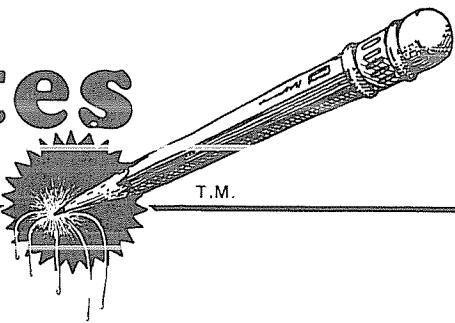
# Notes

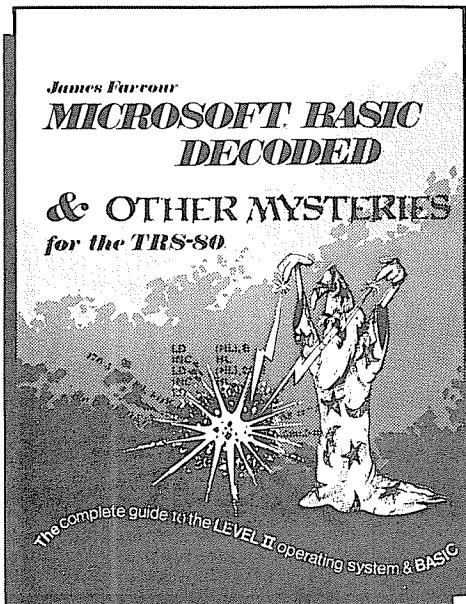


# Notes



# Notes





## MICROSOFT\* BASIC DECODED AND OTHER MYSTERIES

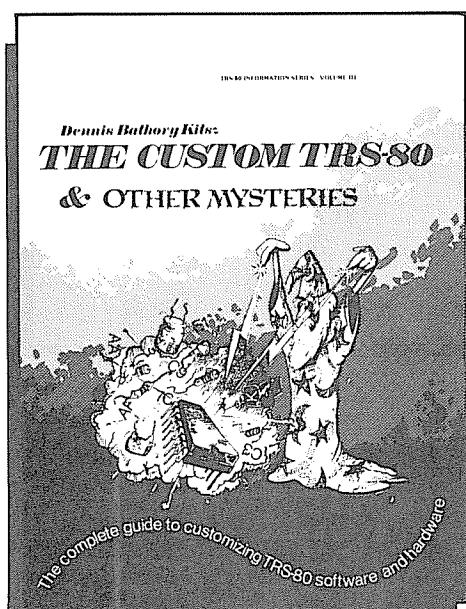
by James Farvour

*Microsoft Basic and Other Mysteries* is the definitive guide to your Level II ROMs. With more than 7,000 lines of detailed comments and 6 additional chapters packed with information, it is easily the biggest and best book about the Level II ROMs available.

Exploit the full power of Microsoft Basic with the aid of more than 300 pages of tested examples, explanations, and detailed comments. *Microsoft Basic and Other Mysteries* is yours for only \$29.95 (plus \$3.00 shipping. CA residents add \$1.80 sales tax. Canada add 20% for exchange rate.)

\* T.M. Microsoft

OTHER  
MYSTERIES BOOKS  
FROM I.J.G.



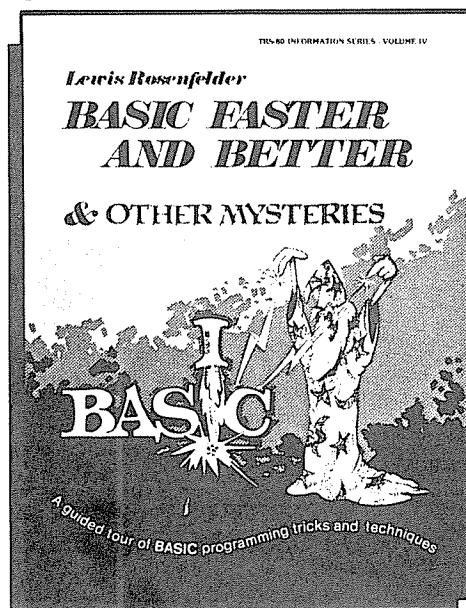
## THE CUSTOM TRS-80. AND OTHER MYSTERIES

by Dennis Bathory Kitzs

Ever wanted to do things to your TRS-80 that Radio Shack said couldn't be done? How about reverse video, high resolution graphics, and audible keystrokes?

Not enough? How about turning an 8-track into a mass storage device, making music, controlling a synthesiser, individual reverse characters, and a real-time clock just to name a few?

*The Custom TRS-80 and Other Mysteries* is packed with more than 290 pages of practical information and can be yours for only \$29.95 (plus \$3.00 shipping. CA residents add \$1.80 sales tax. Canada add 20% for exchange rate.) TRS-80 is a trademark of Tandy



## BASIC FASTER AND BETTER AND OTHER MYSTERIES

by Lewis Rosenfelder

Basic is not nearly as slow as most programmers think. *Basic Faster and Better* shows you how to supercharge your BASIC with almost 300 pages of fast, functions and subroutines.

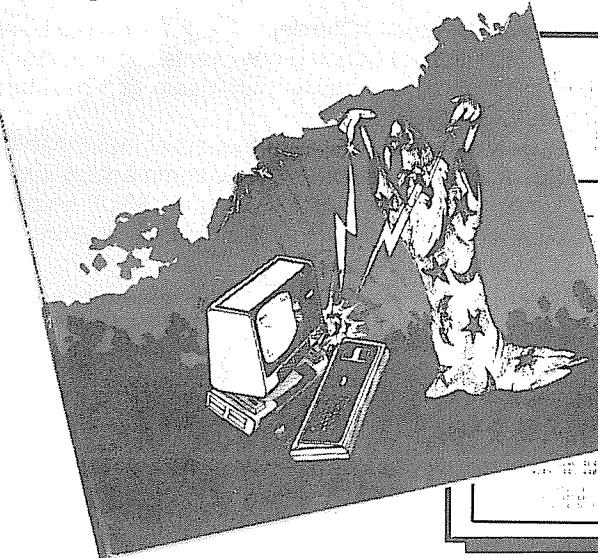
You won't find any trivial poorly designed "check-book balancing" programs in this book — it's packed with *useful* programs.

Tutorial for the beginner, instructive for the advanced, and invaluable for the professional, this book doesn't just talk ... it shows how! All routines are also available on disk, so that you can save hours of keyboarding and debugging.

The #1 disk *BFBDEM* contains all the demonstration programs, and #2 disk *BFBLIB* has all the library functions.

*Basic Faster and Better* is \$29.95, and the two disks are \$19.95 each (plus \$3.00 shipping for book and disks together or separate. CA residents add \$1.80 sales tax for the book, disks add \$1.20 each. Canada add 20% for exchange rate.)

H.C. Pennington  
**TRS-80® DISK**  
**& OTHER MYSTERIES**



# Don't boot-up without it!

## The 'How To' book of TRS-80® data recovery

- 130 page, 8½ x 11 softcover
- Actual memory maps, samples
- Detailed recovery instructions
- Recover lost programs, DOS errors
- Fix parity, gat and hit errors
- Recover from unreadable directory
- Fix Electric Pencil file errors
- Recover lost or killed files

TRS-80 IS A REGISTERED TRADEMARK OF TANDY CORP.

JUST \$22.50

*Get it and unveil the many disk mysteries*

### TRS-80 DISK & OTHER MYSTERIES TABLE OF CONTENTS

#### INTRODUCTION

1.0	HEXADECIMAL - BINARY - DECIMAL
2.0	READING & USING SUPERZAP 2.0
2.1	'SUPERZAP' FUNCTIONS
2.2	'SUPERZAP' COMMANDS
2.3	SPECIAL COMMANDS
2.4	SPECIAL SYMBOLS
2.5	SUPERZAP® DISPLAY FORMAT
2.6	EXAMPLES
2.7	SUPERZAP 3.0
	NEW FUNCTIONS • NEW COMMANDS • USING 3.0

3.0	OTHER UTILITIES
3.1	RSD-2D
3.2	MONITOR 3
3.3	DEBUG
3.4	DIRCHECK
	READING & USING DIRCHECK • BAD HIT SECTOR BYTE • GRANULE FREE BUT ASSIGNED • GRANULE ALLOCATED, ASSIGNED TO MULTIPLE FILES • GRANULE ASSIGNED NOT ASSIGNED TO ANY FILE • GRANULE LOCKED OUT BUT FREE LMOFFSET

4.0	THE DOS
4.1	TRSDOS 2.1
4.2	TRSDOS 2.2
4.3	VTOS 3.0
4.4	NEWDOS 2.1
4.5	FUTURE DEVELOPMENTS

5.0	DISK ORGANIZATION
5.1	GENERAL
5.2	FORMATTED DISKS
5.3	SYSTEM DISKS

6.0	THE DIRECTORY
6.1	INTRODUCTION
6.2	THE GAT SECTOR
6.3	THE 'HIT' SECTOR
6.4	THE FPDE/FXDE SECTORS
	DECODING DIRECTORY ENTRIES • DECODING EXTENTS

7.0	PASSWORDS & OTHER TRIVIA
7.1	GENERAL
7.2	MASTER DISK PASSWORD
7.3	REMOVING ACCESS & UPDATE PASSWORDS
7.4	REMOVING PROTECT STATUS
7.5	MORE TRIVIA

8.0	DATA RECOVERY PROCEDURES & TECHNIQUES
8.1	PROCEDURES
8.2	METHODS
8.3	THE SHELL GAME WITH DISKS
8.4	TRICKS

9.0	DATA RECOVERY
9.1	RECOVERING HASH CODES
9.2	RECOVERING A KILLED FILE
9.3	RECOVER DISK WON'T READ OR BOOT • CLOBBERED OR UNREADABLE DIRECTORIES • SECTOR ZERO • PHYSICAL OR ELECTRICALLY DAMAGED DISKS
9.4	RECOVERING A BAD PARITY ERROR
9.5	RECOVERING A DIRECT STATEMENT IN FILE ERROR • ASCII BASIC & BINARY 'BASIC' FILES
9.6	RECOVER HIT SECTOR ERRORS
9.7	RECOVER GAT SECTOR ERRORS
9.8	RECOVERING ELECTRIC PENCIL ERRORS • DOS ERROR 22 • LOST PENCIL FILES IN MEMORY • LOST PENCIL FILES ON THE DISK • OVERWRITTEN PENCIL FILES • RECOVERING DATA FILES • ASCII AND RANDOM FILES •
9.9	
10.0	CORRECTING THE GAT AND HIT SECTORS
10.1	THE HIT FIX
10.2	THE GAT FIX
11.0	FILES - STRUCTURE
11.1	BINARY BASIC PROGRAM FILES
11.2	ASCII BASIC PROGRAM FILES
11.3	ASCII DATA FILES
11.4	RANDOM DATA FILES
11.5	ELECTRIC PENCIL FILES
11.6	SYSTEM FILES
11.7	MACHINE LANGUAGE LOAD MODULES & LOADER CODES
12.0	SOME THINGS YOU CAN DO
12.1	CONSTRUCTING ELECTRIC PENCIL FILES IN BASIC
12.2	MAKING DATA FILES INTO ELECTRIC PENCIL FILES
12.3	CONVERTING DATA TYPES IN RANDOM FILES
12.4	CONVERTING DATA IN ASCII FILES
12.5	READING BASIC FILES INTO ELECTRIC PENCIL
12.6	READING PENCIL FILES INTO BASIC
12.7	MAKE BASIC PROGRAMS UNLISTABLE
12.8	FIXING OTHER SOFTWARE

GLOSSARY • LEVEL II BASIC TOKENS • DIRECTORY HEX DUMPS FOR TRSDOS 2.2 VTOS 3.0 & NEWDOS 2.1 • HEX CONVERSIONS

MURPHY'S LAW AND OTHER COROLLARIES  
 ORDERING NEWDOS AND SUPERZAP  
 SEARCH PROGRAM LISTING & DOCUMENTATION

DISK MAP (TRSDOS 2.2) • DIRECTORY MAP • GAT SECTOR MAP  
 GRANULE ALLOCATION MAP • HIT SECTOR MAP  
 FPDE/FXDE SECTOR MAP • DIRECTORY ENTRY MAP

1	4D45	4	2052	4F	2E34
2	4659	4	2032	2E34	1
3	5349	4	2032	3000	1
4	4F20	3	130	3430	3000
5	4E4B	4	559	243A	2049
6	5448	4	54E	2031	3530
7	5448	3	454E	2031	2841
8	4258	3	D41	5343	24
9	524E	1	0D32	0D32	46
10	524E	1	0D32	0D32	3
11	3820	4	14E	4420	4258
12	4E20	4	258	3D42	582D
13	524E	1	0D32	0D32	2049
14	2041	4	E44	2042	583C
15	3635	2	042	583D	4258
16	454E	2	042	2D35	1
17	5552	4	E0D	0D20	4258
18	204C	5	345	3A52	4554
19	5345	3	554	5552	1

(Also see figure)  
 = 'END OF RECORD'  
 = LINE NUMBER

BINARY BASIC PROGRAM FILES  
 one is a little tougher  
 lessened binary format and  
 the BASIC st  
 at

The **ELECTRIC PENCIL 2.0** Word Processing System is easy to learn and easy to use. Its simple two-keystroke command structure for text editing makes you a word processing expert in minutes. Every **SYSTEM** and **PRINTING** command is displayed in a menu — simply pick the command you need from the menu. You don't need a six hour instruction course to learn to use *The ELECTRIC PENCIL* since everything you need to know is on one page of the manual. If you need more detail, there are 120 pages of information showing you how to use each command and explaining what it does.

## ELECTRIC PENCIL 2.0 Features:

- Easy to learn - easy to use - menu driven
- All settings are displayed in menus
- Extensive 'HOW-TO' documentation with examples
- Disk version supports tape and Stringy Floppy
- Compatible with all ASCII files (including BASIC's)
- Configure program to your own format
- All print format settings saved with file
- Runs on Model I and Model III
- Runs under all versions of TRSDOS and NEWDOS
- Fast buffer shift and type-ahead in 'INSERT' mode
- Underlining
- No keyboard modifications required
- Compatible with all lower case modifications
- Three print drivers. (parallel, serial and TRS232)
- Recognizes high memory
- Uses printer DCB - you can use any print driver
- Commands to load and save special print drivers
- Special print drivers may be loaded at any time
- Set RS232c and TRS232 options from SYSTEM menu
- Supports serial baud rates from 110 to 9600 baud
- Supports 1500 and 500 baud tape operations
- Cursor speed command
- Incomplete/bad loads saved for your inspection
- 'Printer hangs' eliminated
- All file commands use standard TRS-80 mnemonics
- ALL versions runs with 16K, 32K or 48K
- Automatic print formatting
- Automatic repeating keyboard
- Automatic 'whole word' wrap-around
- Cursor control - up - down - right - left

- Cursor to end of file
- Cursor to beginning of file
- Tabbing
- Scrolling - 5 speeds forward and reverse
- Freeze and continue scrolling
- Cursor to top of screen
- Cursor to beginning of line
- Delete and insert characters
- Delete and insert lines
- Erase line from cursor position to end
- Insert and delete blocks of text
- Backspace and erase characters
- Search from 1 to 38 characters at one time
- Replace from 1 to 38 characters at one time
- Search without replace
- 'Conditional' search and replace
- Cursor positions over 'search' character
- Selective (wild card) search and replace
- Selective (wild card) search without replace
- Search and replace carriage return and form feed
- Repeat command
- Hard Space character
- Concatenation of long lines
- Upper and lower case shift key lock
- Exit any command with a single keystroke
- Automatically displays free memory
- Automatically displays words in file
- Selection of cursor speeds
- Selective clearing of memory
- Set your own power-up configuration

- Warm start command
- Optional automatic titling
- Optional automatic page numbering
- Right justification
- Left margin may be set from 0 to 255 spaces
- Line length may be set from 1 to 255 characters
- Line spacing may be set from 1 to 255 lines
- Page length may be set from 1 to 255 lines
- Page spacing may be set from 0 to 255 lines
- Starting page number may be from 1 to 65535
- Optional print length may be set to print partial files
- Multiple printing of text files
- Single page printing
- Printer configuration control:
  - carriage return on/off
  - line feed on/off
- All options may be changed at any time
- Loads any ASCII file
- Compatible with all files created by previous releases
- Easy backup - no fancy protection features
- Cassette control for dictation - DICTAMATIC
- Loads multiple files
- Fast disk I/O - loads 36K in under 8 seconds
- 36K text buffer (48K disk system)
- All machine language program
- Manual available separately
- Source code available - 'THE ELECTRIC PENCIL HANDBOOK'

Software packages, like people, usually have "personalities". It is **The Electric Pencil's** personality that makes it easy to use. Unlike other word processors, it has a simple two-keystroke command structure. In plain English, this means that you only have to press two keys to execute any of the 'control commands' such as **INSERT**, **DELETE**, **PRINT** and others.

The **Electric Pencil** does not require a six hour tape instruction course before you can learn how to use it. You will not have to keep your nose in a manual to make it do the things you want. You do not need special key-decals to remember key functions. It does not require that you use complicated 'command syntax' to accomplish the things you want to do. In fact, you will probably be able to start making productive use of **The Electric Pencil** in under one hour!

The **Electric Pencil** is a Character Oriented Word Processor. This means that text is typed in as a continuous 'string' of characters and is handled as such. (A 'string of characters' means a group of letters, symbols and numbers - like the text you are reading now.) This allows you enormous freedom and ease in the movement and handling of text. Since the lines that will be sent to the printer are not specified in advance, any number of characters, words, lines or paragraphs may be inserted or deleted anywhere in the text. The entire text is shifted as you insert and delete characters.

The typing of carriage returns as well as word hyphenation is not required since each line of text is formatted

automatically. As text is typed in and the end of a screen line is reached, a partially completed word is shifted to the beginning of the following line. This makes the text easier to read because words are not broken (or to use computer jargon, 'wrapped around' the screen) from line to line.

Whenever text is inserted or deleted, existing text is shifted down or shifted up. Everything appears on the video display screen as it occurs, and eliminates any guesswork. Text may be reviewed at will, by variable speed scrolling in both directions.

By using the **SEARCH** or the **SEARCH and REPLACE** function, any 'string' of characters may be located and/or replaced with any other 'string' of characters. Specific sets of characters within encoded strings may also be located and used in creating selective mailing lists.

When text is printed, **The Electric Pencil** automatically inserts carriage returns where they are needed. Many combinations of line length, page length, character spacing, line spacing and page spacing allow for any form to be handled. Right Justification gives right-hand margins that are even. Pages may be numbered as well as titled.

### Companion programs available soon:

- BLUE PENCIL** - Dictionary - Proofing
- RED PENCIL** - Automatic Spelling Correction
- PENCIL TIP** - Dynamic print formating
- PENCIL GRAM** - Communications Program
- TALKING PENCIL** - A word processor for the visually handicapped
- ELECTRIC TYPE** - Type setting interface
- DRAWING PENCIL** - Graphics addition
- PENCIL KIT** - Special utilities for PENCIL
- DRIVERS I** - Print drivers with source and object code



Upland, California